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ORIGINAL COMMUNICATIONS.

ART. XLIV.—*On Acorus Calamus.*—By R. Eglesfeld Griffith, M. D.

Nat. Ord. Aroideæ.

Sex. Syst. Hexandria Monogynia.

Acorus. *Spadix* cylindric, covered with florets. *Corolla* six-petalled, naked. *Style* none; stigma a mere prominent point. *Capsule* three-celled, three-seeded.—*Nuttall.*

A. *calamus.* Leaves and stems ensiform. *Spadix* cylindric, obtuse, solitary oblique, protruding from the side of an ensiform leave-like scape. *Capsules* three-celled, many-seeded.

Synon. *Typha aromatica, clava rugosa.* Morrison.
Acorum legitimum. Tabermontamus.
Acorus indicus. Geoffroy, v. ii. p. 5.
A. *asiaticus.* Dale, 259.
A. *calamus.* Lin. Sp. pl. Pursh. Fl. Am. Sep. 1, 235. Bigelow, Flor. Bost. 83. Beck, Bot. North and Mid. States, 381. Bart. Com. Flor. Phil. i. 169.

Icon. Rheede. Hort. Malabar. vol. ii. t. 60. Smith, English Botany, 356. Barton, Med. Bot. vol. ii. t. 30 &c.

Common names. Calamus. Sweet flag. Flag root. Sweet root &c.

Pharm. Acori Calami *Radix.* Edin. Calami *Radix.* Lond. U. S. Acori *Radix.* Dub.

Offic. Root. Somewhat flattened, externally wrinkled, of a yellowish brown colour, having on its under surface, numerous small circular spots. Internally, whitish, or yellowish. Texture light and spongy. Odour strong and fragrant. Taste warm, bitterish, pungent aromatic.

Description.—Root perennial, horizontal, rugose, jointed, somewhat compressed, from half an inch to an inch in thickness, and from six inches to two feet in length, furnished on the lower side with numerous fibres. The joints are from half an inch to an inch in length, and are variously shaded with different shades of red, white and pungent. From the joints proceed bunches of hairlike brown brown fibres. Internally the root is white and spongy, and has a peculiarly aromatic and spongy smell. The taste is aromatic, penetrating and even acrid. The leaves are all radical, sheathing at the base, of a red colour below and green above; they are long, flat and sword shaped. The scape is similar to the leaves, but is generally longer, and bears about its middle a spadix or spike of flowers. This is solitary, oblique and cylindrical, from an inch to three inches in length, and attenuated towards its ends with an obtuse termination. The flowers are small, and arranged in a spiral form, they are of a greenish colour, and consist of six equal truncated petals, without an enclosing calyx; the stamens are generally six in number, the filaments are thick, and the anthers bilobate. The germ is sessile and gibbous, crowned by a pointed stigma. Capsule oblong, containing numerous minute seeds.

Habitat. The A. *calamus* is found in most parts of the world, on the margins of small streams, generally in company with the blue flag and the cattail. It, however, is also found in other wet places, low meadows, swamps &c. It is never cultivated, as it is extremely abundant. It flowers in May or June.

Bot. History. The term Acorus is derived from the Greek, and alludes to a belief that it was possessed of curative powers in diseases of the eye. There appear to be but two species, that under consideration, and the A. *gramineus*, a native of China, which has narrow leaves, and the spadix nearly terminal. The A. *calamus*, however, presents some differences, according to the country in which it grows, but they do not appear of sufficient importance to warrant a separation into distinct species; added to which, their mode of growth and sensible properties are perfectly identical.

Med. History. Although the name of Calamus *aromaticus* has been applied to this plant, under the idea that it was the same as the remedial agent spoken of by the ancients under that appellation, there is but little or no ground for the supposition. From the descriptions of this medicine given by Theophrastus, Galen, Pliny and others, it would appear that it consisted of reddish, knotty stems and roots, which were easily broken, filled with a pith, viscous on being chewed, and of a bitter astringent taste. The plant furnishing them perfumed the air around the places in which it grew. It was said to be a native of India, Arabia &c. As, however, there have been no figures of it handed down to us, it is impossible to decide with any certainty on the true character of the plant, and the confusion has been added to in no slight degree, by the fact that the Acorus *calamus* was, at a very early period after the revival of science, assumed to be the species spoken of by the more ancient writers, and was substituted for it in the treatment of the diseases for which it was recommended. It would be a waste of time to examine all the various theories that have been promulgated; some of the most striking, and which are sanctioned by high authority, will amply suffice to show the complete uncertainty that exists on the subject. Matthiolus, in his commentaries on Dioscorides, whilst admitting the true calamus was unknown, gives a representation of what he supposes it would be found to be; this imaginary plant is, likewise, admitted by Bauhin in his Pinax. The celebrated Clurius first figured the Acorus *calamus* as the true plant in his *Plant. Rar.* lib. ii. p. 230, but afterwards, in an edition of Garcias, which he prepared for the press, retracted his former opinion, and replaced this design by another, representing an umbelliferous plant. In 1640, Prosper Albinus, in *Plantæ Exoticæ*, gave the figure of a plant from Egypt, which he termed *Cassal al darira*, and says it resembles a Lysimachia; and Lemery in his *Dict. des Drogues*, judging from his description, has assumed the same plant as the true calamus. Linnæus refers it to his Andropogon *nardus;* and finally, Guibourt has endeavoured to show that it is identical with the Gentiana *chirayita*. Merat and

Delens, in their excellent Dictionary of Materia Medica, from which the above is condensed, are inclined to believe that it is the variety of the Acorus *calamus*, occurring on the Malabar coast, and figured by Rheede, (Hort. Malabar, t. ii. 48,) under the name of *vaembu*. Be this as it may, we now find in commerce nothing but the roots of the A. *calamus* and its varieties.

Medical properties and uses.—The root, which is the part used, is a warm and aromatic stimulant, and enters into the composition of several pharmaceutical preparations. It forms either alone in infusion, or in combination with other articles, an excellent excitant in windy colic, in dyspepsia and other deranged states of the gastric organs. Dr. Barton states that in such cases he has been eminently successful with it, and also recommends it to be chewed by dyspeptic persons, and the juice swallowed, to relieve that torpor of the stomach so common to those affected with that disease, and which leads too many of them to a constant use of alcoholic stimulants. Dr. Thomson says, from his own experience, it is one of the best adjuvants to bark and quinine in intermittents, and that it has been used alone successfully in this disease. In India it is a favourite remedy, and Ainslie informs us, that it is reckoned so valuable in indigestion and bowel affections of children that there is a penalty incurred by any druggist who will not open his door in the middle of the night and sell it if demanded. The Arabians and Persians consider it as a powerful aphrodisiac and carminative. The Turks candy the roots and regard them as a preservative against contagion. It, however, is little used in this country, though it presents far more claims than numbers of other stimulants of foreign origin; but in medicine, unfortunately, few articles that are within the reach of all, from their cheapness and plenty, are considered to possess powerful remedial virtues, whilst the utmost confidence is placed in those which are expensive and derived from a foreign source.

Pharm. preparations and mode of administration. It may be given in substance in the form of powder in intermittents, in doses of ℈i. to ʒi., or in infusion (ʒvi of the bruised root

to ℥xii of boiling water) to the extent of a teacup full twice daily. When used for the flatulent colic of infants it is best combined with magnesia and chalk. It enters in a variety of the compound medicines of the foreign pharmacopœias, as the mithridate, orvietan, theriac &c. It should never be prescribed in decoction, as this mode of preparation dissipates the volatile oil, in which the virtues of the plant appear to reside.

Analysis.—From an examination of this plant by Tromsdorff, (Ann. de Chim. tom. xviii.) it appears that sixty-four ounces of the fresh root afforded him fifteen grains of volatile oil, ℥i. of inulin, ℥iii. of gum, ℥iss. of viscid resin, ℥xiij. ʒvi. ligneous fibre, ʒix. of extractive matter, and ℥xvii. of water. Mr. Gray obtained 29 oz. of the volatile oil from 7 cwt. 23 lbs. of the roots. This oil, it is stated by Dr. Thompson, (*Mat. Med.* 1.) differs from most of the other volatile oils in some particulars; it does not dissolve iodine; it instantly decomposes sulphuric acid, but is slowly acted upon by the nitric. It is lighter than water, of a pale yellow colour, and possesses the odour and pungency of the plant in an eminent degree.

Œconomical uses.—According to Bechstein, the leaves may be employed to protect woollen clothes from moths, and books from the ravages of worms. The plant has also been used for tanning leather. In this country it is extensively used in the preparation of wine bitters. Neither horses, cows, sheep, or hogs will eat any part of this plant. The best time to collect the roots is in the autumn. The only preparation they require is a careful washing, removal of the fibres and drying. They are often presented for sale with the whole of the epidermis removed; this, though it improves their appearance, deteriorates them, as the greater proportion of the active principle is thus destroyed.

ART. XLV.—*Note on James' Powder.* By J. R. Coxe, M. D. *Professor of Materia Medica &c. in the University of Pennsylvania.*

The virtues of James' Powder have been so long established by multiplied experience in every quarter of the globe, that it is not surprising that a succedaneum for it should have been many years ago presented to the public, by the British pharmacopœias, under the modified names of *Pulvis antimonialis*, by the London and Dublin Colleges; of the *Oxidum antimonii cum phosphate calcis*, by the College of Edinburgh. Little difference exists in the formulæ of those respective places; being founded principally on the analysis of James' powder, by Dr. Pearson, who constructed the formula that is presented by them, and which was followed by the United States Pharmacopœia of 1820, and by that of New York in 1830—whilst it is totally rejected by the Philadelphia Pharmacopœia of the same year.

I believe the *real* formula of James' powder was never given to the public, although a prescription for it appears under the sanction of an oath in the patent-office of England! The analysis given by Dr. Pearson of this celebrated nostrum makes it to consist of 43 parts of phosphate of lime, and 57 of oxide of antimony. Subsequently to this, appeared another, by M. Pully, of Naples, communicated in the 65th volume of the Ann. de Chimie, who observes that Pearson's analysis will not enable any one to imitate this celebrated compound; and, in fact, it has been generally conceded, that, although the pulvis antimonialis may in all probability be essentially the same with James' powder, yet there is a considerable difference in respect to their doses. At one time it was imagined that the pulvis antimonialis was nearly double the strength of its celebrated original; whilst more lately the former has been affirmed to be possessed of little or no value. Such discrepancy of opinion can only be be explained, by a presumed diversity in the preparations, arising from imperfect analysis; for, even as respects the James' powder itself, we find *two persons* professing to pre-

pare it in London, and each asserting to be the only proprietor of the genuine receipt! Pully differs greatly from Pearson in the analysis he has afforded—this last stating, as above mentioned, that it consists of 43 parts of phosphate of lime, and 57 oxide of antimony; the former, as composed of 37 parts of protoxide of antimony, 21 phosphate of lime, 24 sulphate of potash, and 18 of potassa combined with protoxide of antimony! Such diversity in the analyses tends to throw suspicion on them both; and as the original formula of Pearson seems itself to have undergone considerable modification by doubling the proportion of the hartshorn shavings, it can scarcely be wondered at, that much diversity should prevail as to the real character of this article, in a remedial point of view. Perhaps it may however be explained by recollecting that almost, if not all, the active preparations of antimony contain the *protoxide*, whilst the plan of proceeding in both Pearson's and Pully's formula tends greatly to convert it into the *peroxide*, in which state, it is comparatively inactive. As it may chance to be prepared, it may therefore happen that it may occasionally possess more or less of either of these oxides, and thus appear of various activity at different times. Presuming that all except the oxide of antimony is really useless or inert in the preparation, it is probable that all that we anticipate from either James' powder, or from the pulvis antimonialis might be obtained from the protoxide alone, and nearly such a plan was at one time proposed in the Philosophical Transactions, by Mr. Chenevix. "Dissolve," says he, "together or separately, in the least possible portion of muriatic acid, equal parts of the white oxide of antimony (formerly called Algaroth's powder,)—a protoxide—and of phosphate of lime. Pour this solution gradually into distilled water, previously alkalizated by a sufficient quantity of ammonia; a white and abundant precipitate will take place, which well washed and dried, is the substitute I propose for Dr. James' powder."

In order to facilitate this plan of Chenevix, and establish an undoubted uniformity in the preparation, I have long since recommended the obtaining the phosphate of lime by preci-

pitation from the muriate, through the addition of phosphate of soda. This, well washed, affords a phosphate of lime, unequalled in purity; whilst the pulvis Algarothi, slightly washed with a weak solution of ammonia, will be as perfect a protoxide as can well be prepared. Unable to say with confidence which analysis, (that of Pearson or of Pully) is most to be relied on, it would be injudicious to recommend the proportions they individually mention, as being either superior to the other; I have made up the article by both proportions, and have found them efficient, so as scarcely to give a preference. A better proportion is, however, I think, to be found by taking *equal parts* of phosphate of lime and protoxide of antimony. So far as regards its activity, I think it approaches nearer to that of James' powder than when formed by either the process of Pearson or Pully; but if, as I have above stated, the very heirs of James pursue a different mode of preparation, we cannot wonder at the difference of opinion that has prevailed in relation to the powder itself, or the substitutes that have been adopted.

It is very desirable that the real merits of this powder should be shown, for although I consider it as having been at one time too highly praised, I cannot believe it to be so utterly devoid of utility as has latterly been supposed.

ART. XLVI.—*On Poisoning with the Preparations of Chrome. By* T. J. Ducatel, M. D. *Professor of Medical and Pharmaceutical Chemistry, University of Maryland.*

Communicated by the Author.

Dr. Christison, in his elaborate Treatise on Poisons, has furnished us with full accounts of the toxical properties of most of the substances used as remedial agents, and of such as are employed in the arts. There are but few chapters in that excellent treatise to which more recent discoveries have as yet added any thing of importance; and the least satisfactory of its sections, perhaps, is that which relates to the properties of the chemical preparations of chromium. In reference to these, nevertheless, and in the short notice which is taken of

them, the principal facts connected with their natural history as poisons are mentioned. Our intention, therefore, is solely to consign a few additional facts to this history, relating as it does to substances produced on a large scale in our immediate vicinity, extensively used in the arts of painting and dying; and the noxious qualities of which, though sufficiently familiar to some, to have been already resorted to for criminal purposes, seem not so generally known to medical practitioners, as the latter circumstance now renders it necessary that they should become.

Chromium is arranged by Dr. C. in his third order of the irritant class of poisons, which includes the compounds of the metals. It is associated with tin, silver, gold, bismuth and zinc, and their effects it is said, are "passed over shortly; because they are little known as poisons, and it is therefore only necessary that their existence and leading properties be mentioned." But circumstances to which we have just alluded, require that greater interest should be attached to the metal now under consideration; and that every ascertained fact relating to the physiological and pathological action of its preparations, considered as toxical agents, should be systematically laid down. In attempting to do this, we shall follow Dr. Christison's method, when treating of the other metallic poisons regarded as of more importance, namely, arsenic, mercury &c., commencing with a brief account of so much of the chemical history of the preparations of chromium, as it is necessary for every medical man to know.

Of the Chemical History and Tests for the Preparations of Chromium.

Chromium is with difficulty obtained in its pure state. It is a white metal, brittle, and very infusible. With oxygen, it forms two definite compounds—the green oxide, and chromic acid.

The proto, or green oxide,* of chromium is insoluble in

*The *chrome green* of commerce is a different article. This is a mechanical mixture of chrome yellow and Prussian blue, with occasionally an additional admixture of whiting.

water: it is nearly infusible, and when strongly heated resists the action of the most powerful acids. It is a salifiable base, the salts of which, when in a solution, may be distinguished by the following characters. The solution has usually a dark green colour. Ammonia, and an infusion of nutgalls throw down a green precipitate. Potassa does so likewise, but the precipitate is redissolved by an excess of the alkali. This protoxide of chromium is used in the arts for painting upon porcelain.

Chromic acid is characterised by its colour, which is a dark ruby red. It is very soluble in water and in alcohol. The solution is partially decomposed by heat, and when boiled with sugar, starch, and other organic principles, the acid is converted into the protoxide. The coloured salts which the chromic acid forms with the alkaline bases, are extensively used in the arts. The chief of these are the chromates of lead and of potassa. These salts are in general sufficiently characterised by their colour, which is either yellow or red, the latter colour predominating whenever the acid is in excess: but they may be chemically distinguished by the following test:—"On boiling a chromate in muriatic acid mixed with alcohol, the chromic acid is at first set free, and is then decomposed, a green muriate of the oxide of chromium being generated."*

The chromate of lead is composed of one equivalent of acid, and one equivalent of the protoxide of lead. It occurs in commerce of various shades of yellow, according as the liquor with which it has been prepared was more or less acid. It is used as a pigment under the name of *chrome yellow*; and has also been reprehensibly employed by confectioners for colouring sugar plums. Confects suspected of being rendered poisonous in this way, are easily tested by digesting them in distilled water, which dissolves the saccharine and various extractive matters, entering into their composition, and leaves untouched the colouring ingredient. When the solution is thoroughly effected, it should be carefully decanted, and the

* Dr. Turner's Elements of Chemistry.

residue repeatedly washed, then dried on a stove. If it consist of chromate of lead it will, when mixed with a little carbonate of potassa, and exposed to heat in a small crucible, be decomposed, forming an insoluble carbonate of lead, and a soluble chromate of potassa. A solution of the latter in water will yield a yellow precipitate on the addition of a small quantity of a solution of acetate of lead, and a red precipitate with a solution of nitrate of mercury.*

A dichromate of lead is sometimes prepared, which consists of one equivalent of chromic acid, and two equivalents of protoxide of lead. It is a beautiful red colour and has likewise been employed as a pigment.

Chromate of potassa—the neutral chromate—consists of one equivalent of acid and one of potassa. It occurs in commerce in small prismatic crystals of a lemon, yellow colour: it is soluble in water, but *insoluble* in alcohol.

Bichromate of potassa crystallizes in rectangular or square prisms, of a beautiful red colour: it is soluble in about ten times its weight of water at sixty degrees, and the solution has an acid reaction: it is insoluble in alcohol. This salt and the preceding are used in dying.

Of the Physiological and Pathological Action of Chromium and its Preparations.

Chromium in its pure state, like all other metals, doubtless exerts no influence on the animal economy.

A solution of the salts of the protoxide of chromium has a peculiar taste which is strong, but rather agreeably sweet. The salts of this genus are probably poisonous; but their properties, in this respect, have not been investigated.

Chromic acid possesses an intensely sour taste, with a considerable degree of astringency: it stains the skin yellow, and the stain cannot be removed by water, but requires the agency of an alkali. Should there be any abrasion of the cuticle, a painful ulcer will be produced. It is no doubt to the free acid

* We have reason to believe that the mixed article—*chrome green*—mentioned in a previous note, is also employed as a colouring material by confectioners. Although not so injurious as the *chrome yellow*, its use is improper.

present in the vats of dyers who use the bichromate of potassa, that we are to ascribe the troublesome sores with which Dr. Duncan first reported the workmen of Glasgow to be attacked. These sores are represented as gradually extending deeper and deeper, without spreading, till they sometimes actually make their way through the arm or hand altogether.* This singular effect of a strong solution of bichromate of potassa, is well known in this city, where the article is manufactured in large quantities. Dr. M. Baer informs us that he has observed it in above twenty cases. Whenever there was the slightest injury of the skin, the solution would produce a painful burrowing ulcer, which continued in spite of all treatment, even so as to penetrate the limb, unless the workman was promptly removed from the room in which the substance is manufactured. Dr. B. further remarks, that he has seen ulcers situated on parts of the body, where he is sure the solution did not come in contact. He thinks it probable, that these were produced by vapours charged with chromic acid. On the other hand, the most concentrated form of the solution made no impression upon parts where the cuticle was in a state of integrity. There is no question but that chromic acid taken into the stomach, will occasion all the violent irritating and corrosive effects of other mineral acids, and give rise to the same inflammatory symptoms by which the action of these is characterized.

The chromates of lead may be considered as doubly poisonous by their radical and base.

The neutral chromate of potassa, when swallowed will probably cause inflammation, but perhaps not of a violent kind.

The bichromate of potassa is the most interesting of the salts of chromium, in a toxicological point of view. Its effects on the animal economy have been experimentally investigated by *Gmelin*. The results of these experiments are stated by Dr. Christison as follows:—"He found that in the dose of a grain the *chromate* of *potassa* (bichromate of potassa) has no effect when injected into the jugular vein of a dog,—that four

* Dr. Christison's Treatise.

grains produced constant vomiting, and death in six days, without any other striking symptom,—and that ten grains caused instant death by paralysing the heart. Its effects, when introduced under the skin, are still more remarkable. It seems to cause general inflammation of the lining membrane of the air passages. When a drachm was thrust in the state of powder under the skin of the neck of a dog, the first symptoms were weariness and a disinclination to eat. But on the second day the animal vomited, and a purulent matter was discharged from the eyes. On the third day it became palsied in the hind legs; on the fourth it could not breathe or swallow but with great difficulty; and on the sixth it died. The wound was not much inflamed; but the larynx, bronchiæ, and minute ramifications of the air tubes, contained fragments of fibrinous effusion, the nostrils were full of similar matter, and the conjunctiva of the eyes were covered with mucus. In another dog an eruption appeared on the back, and the hair fell off." It is elsewhere* remarked, in general terms, of this salt, that its action on the animal economy determines convulsions, and palsy; and that it seems to occasion death by paralysing the nervous system. A strong analogy will be perceived in the above account of the action of bichromate of potassa, to one of the varieties of poisoning with arsenic.

Several fatal cases of poisoning with the saturated liquor of the bichromate of potassa, have occurred in this city. The following has been communicated by Dr. Baer:—A labourer, aged thirty-five years, on attempting to draw off from a refiner a solution of the bichromate of potassa, in the effort to exhaust the syphon by suction, received a small quantity of the solution in his mouth. His first impression was that he had spit out; but only a few minutes elapsed before he was seized with great heat in the throat and stomach, and violent vomiting of blood and mucus. The vomiting continued until shortly before his death, which took place about five hours after the accident.

* Journal de Chimie Medicale.

What has now been said of the bichromate of potassa, is equally applicable to the bichromate of soda, a preparation, however, which is seldom met with out of the laboratory.

Of the Morbid Appearances caused by Poisoning with the preparations of Chromium.

The morbid appearances in the body of the individual, whose case is furnished by Dr. B., were the following:—The mucous tissues of the stomach, duodenum, and about one-fifth of the jejunum, were found destroyed in patches. The remaining parts could be easily removed with the handle of the scalpel. The lower part of the intestinal tube appeared to be healthy.

The post mortem examination of a dog, killed fifteen minutes after taking a second dose of a strong solution of the bichromate, which caused violent vomiting, exhibited the mucous tissues from the mouth throughout the whole of the primæ viæ very much thickened, and in a high degree of inflammation. At the greater curvature of the stomach immediately opposite to the cardiac orifice, the mucous membrane was gangrenous, and easily wiped off with the fingers. The muscular and peritoneal coats were also much injected.

Of the Treatment of Poisoning with the preparations of Chromium.

The chemical treatment of poisoning with the bichromates —the bichromate of potassa, and the bichromate of soda— consists in administering a solution of carbonate of potassa or soda, (the latter in preference,) thereby neutralizing the excess of acid to which the injury may be mainly ascribed. The subsequent inflammation is to be treated on general principles.

One juridical case has come within our knowledge, being on the charge of an attempt to poison by mixing bichromate of potassa with the whiskey of a dram drinker, in which the accused was acquitted chiefly in consequence of the uncertainty manifested by the medical witnesses as to the real properties of this now well ascertained, virulent poison. It is

this circumstance which has induced us to collect for publication, whatever appeared to be satisfactorily known of the toxical qualities of the salts of chromium.

Baltimore, Aug. 24th, 1833.

ART. XLVII.—*On the proposed method of Analysing Mineral Waters by Alcohol. By* Henry D. Rogers.

Chemists have long been aware of the peculiar uncertainty attending the analysis of mineral waters; an uncertainty proceeding not from any difficulty in detecting and ascertaining their ultimate ingredients, but from that of conjecturing with any absolute accuracy the particular combination in which they present themselves, when thus held in solution in the water of a spring, which in many cases contains a great variety of substances.

It is true, that the same kind of embarrassment arises when the chemist undertakes to compute the manner in which the constituents of any complex compound whatever, are associated, and always, for the same reason, that in separating substances by analysis we must employ agents, and these agents may operate, and indeed they confessedly do oftentimes operate, *to generate* a particular combination of the elements, differing widely from any previous state of union that existed in the body analyzed.

That this is especially the case in organic analysis, where the variety of combinations possible in the elements is so multifarious, there can be no doubt, else how can we account for the ten or more distinct products recently derived from opium, for example. And this is one reason why it is so necessary to know the methods adopted in every case by the experimenter, as each inquirer, by pursuing his own plan, may develope results which will not be found to harmonize with those of others, and thus be productive of much perplexity. Hence arises the necessity of deducing our opinion of the true state of combination in a compound, in so great a degree from indirect

reasoning, leaving the door open to a variety of conjecturings, of which we have a strong instance in point in the case of alum, the common double sulphate of alumina and potassa, in which Berzelius represents the ingredients to be thus united ($\ddot{A}l + 3\ddot{S}$) + $\dot{P}o + \ddot{S}$) + 24 Aq.—or 2 of alumina and 3 of sulphuric acid, united to 1 of potassa and 1 of sulphuric acid; while Phillips arranges it thus: ($\ddot{A}l + 2\ddot{S}$) + ($\dot{P}o + 2\ddot{S}$) taking one equivalent of acid from the alumina and giving it to the potassa.

It was from such reflections that I was induced to repeat some of Mr. Cohen's leading experiments in strict accordance with his detail of them, both as to order and manner, and if after these precautions, a discrepancy between our results is the consequence, I can only request that your chemical readers will institute a few of the experiments for themselves in order that they may judge of the causes of this variance in our conclusion.

At the same time I do not imagine that it can be a matter of much moment, however interesting it may be in a chemical point of view, to ascertain the true mode of arrangement; for in those cases where we desire to imitate a natural mineral water, it is easily effected by mingling the elements in a soluble form in the proportions indicated by analysis.

But it must be observed, that it by no means follows that we can command the same means of effecting certain combinations as are at the disposal of nature, and therefore that although we may apparently place together the same substances, we may entirely fail in developing the peculiar properties by means of which they sometimes act so energetically on the system. Many mineral waters come from great depths, and all their phenomena indicate that they are occasionally subject to immense compression. Now of the circumstances of chemical combination under pressure we know nothing, and at the same time are equally ignorant of the great advantage possessed by nature, in bringing elements together in the bowels of the earth in that state which chemists call *nascent.* When, for instance, we advert to the amazing quantity of that ordinarily insoluble body, silica,

held in solution in the hot springs of Iceland, and the inexplicable presence of nitrogen in nearly all the thermal waters in the world, we are obliged to confess our incapacity to account for them.

Influenced by the hope held out in the commencement of Mr. Cohen's paper, that alcohol would afford a means of separating directly the salts from a mineral water, in the state in which they naturally exist in it, I have taken some pains to revise his article experimentally, though I confess I could not discover why alcohol, like other agents, should not exercise some influence in modifying the affinities of the dissolved substances. I however followed his own train of procedure, with the following results:—

Repeating experiment 1st, I dissolved in 600 grains of pure distilled water, six grains of chloride of calcium, and the equivalent proportion of bicarbonate of soda in nearly 700 grains of the same fluid, thus the two solutions each contained $\frac{1}{100}$ of salt.

A. On mingling the two solutions by pouring the former into the latter, a perceptible milkiness was produced, accompanied by some effervesence. This milkiness, which in some cases did not show itself for half a minute, rapidly increased by repose, until after the lapse of about an hour a copious white precipitate covered the bottom of the vessel. The supernatant liquid A gave a precipitate both with carbonate of ammonia and nitrate of silver, showing that it contained undecomposed chloride of calcium.

The precipitate was collected and weighed, it amounted to 2.3 grains whilst the whole quantity present was only 5.5 grains, it was then treated with dilute hydrochloric acid, which occasioned an effervescence and completely dissolved it. Tested by carbonate of ammonia, it proved to have been carbonate of lime.

Here then is a flaw in Mr. Cohen's experiments of some importance, inasmuch as we are led to doubt the assumed stability of chloride of calcium and carbonate of soda, when brought together in solution; it is in truth, a well known fact that these two salts are not compatible, but on the contrary

mutually decomposed each other, and it is more than probable that the lime in the congress water, exists in the state, not of a chloride, as he infers, but in part at least as a carbonate, kept in solution by the excess of free carbonic acid.

It is obvious that the precipitation of carbonate of lime, which at first is very slight, was overlooked by the experimenter, proceeding forthwith to the addition of the alcohol, the consequence of which would be, that not only the undecomposed carbonate of soda would fall down as described, but also by the escape of carbonic acid, the carbonate of lime, which I have proved to be formed, and kept until now in disguise, would likewise precipitate.

B. In experiment 3d, of the paper, thirty proportions of highly rectified alcohol were added to the mingled solutions, and Mr. Cohen mentions that a bulky precipitate fell down without any effervescence, and was found to be pure bicarbonate of soda. In our repetition of this experiment we were of course compelled to filter in order to get rid of the precipitated carbonate of lime, when on adding the proportions of alcohol, we procured not only a precipitate, but likewise a considerable effervescence. Being aware that the addition of concentrated alcohol to water produces the disengagement of bubbles of air, we mixed portions of these fluids in the same proportions for the sake of comparison, but the effervescence was obviously much less. From this effervescence, it is evident that the soda could not have fallen as a bicarbonate, and it is evident to us that the precipitate contains also carbonate of lime, vitiating therefore all the proofs in favour of a quantitative analysis by this method.

C. After this precipitate had entirely fallen down, to prove that the carbonate of lime, before held up by the carbonic acid, had gone down, as just stated with the carbonate of soda, we filtered and tested with a moderately concentrated solution of carbonate of ammonia, whereupon a curious formation of acicular crystals of carbonate of ammonia took place, precipitated from the test, but no trace of lime.

Not satisfied with this, another portion of B was filtered and boiled, but here again there was no trace of any remaining carbonate of lime.

D. In the second stage of the experiment, viz. after the alcohol is added there should remain, if Mr. Cohen is right, only chloride of calcium in solution; with a view to test this, a portion of the alcoholic solution B was carefully filtered, and then evaporated to drive off all the alcohol, when chloride of sodium was procured, as was unequivocally proved by its crystallization and taste.

To conclude then, as we have shown above that we have two carbonates precipitated, where if the analysis was correct there should be but one, so here we have two chlorides in solution when that of lime only ought to occur.

Not having access to specimens of congress water, which we could rely upon as genuine, we have made no analysis of it, nor do we deem it essential to the present description.

The experiments above quoted, we believe, are sufficient to remove all confidence which from its apparent simplicity we might be inclined to place in the use of alcohol as a substitute for heat in this branch of analysis. But even suppose that alcohol could be applied in the first stage as proposed, we do not find from Mr. Cohen's memoir that he has been enabled more than other chemists to dispense with a certain amount of conjecture, as to the manner in which the elements are associated in the water examined.

A hope was held out that the various salts present might be separated directly by alcohol, but we do not discover that his method of distributing the ingredients has been any other than the ordinary inferential reasoning, which shares each acid among all the bases, and *vice versa*, each base among all the acids, a method advocated, as he himself says, by Berzelius and other eminent analysts. How, for example, has the alcohol enabled him to distribute the 18 grains of chlorine (E) in equivalent quantities between the magnesium and calcium, or how enabled him to know that the iodine is in union *only* with the magnesium and not with the calcium and other bases, or that the carbonic acid is held exclusively by the soda. Throughout all the steps but the first, employing the same agents that every chemist employs, there of

course occurred the usual destruction of the natural combinations of the substances in the water, and to restore these to their presumed original state, he has been compelled to resort, as others do—to conjecture.

There are one or two other points about which we are at issue with Mr. Cohen, and with these, and a request that he will excuse our criticism, we shall close our communication. The method of estimating the soda by deflagrating the acetate with nitrate of ammonia, to burn off the acetic acid, is by no means a good one, as a quantity of carbonic acid is inevitably generated. It is moreover out of the question to attempt the estimation of bromine quantatively when, as in the Saratoga waters, it is associated with chlorine. Nor, as we would beg leave to suggest farther, is the method of detecting bromine by sulphuric acid and gold, employed by Mr. Cohen, of any value in this instance, inasmuch as the same phenomena are exhibited if iodine be present.

As a means of extending a knowledge of the valuable mineral and medicinal waters of our country, we would be glad if any of your readers or correspondents would transmit to us through you, for analysis, specimens of such waters, carefully put up in bottles well sealed, from their respective neighbourhoods.

ART. XLVIII.—*On the Vegetable Tonics of the United States.*

By R. Eglesfeld Griffith, M. D.

No term has a less exact meaning than that of tonic, and the class of remedial agents, so designated, has accordingly been restricted or enlarged to a very great extent, according to the theoretical views entertained by each author that has treated on this subject. Nor has the question, What is the tonic principle in vegetable substances? given rise to less difference of opinion. As this, however, is not the proper place

to enter into an examination of the arguments advanced in support of the respective theories which have been promulgated, we will merely add, that as bitterness is a striking quality of the greatest proportion of those plants which are recognized as vegetable tonics, and has been regarded by some of the most eminent writers on materia medica as their essential attribute, in the ensuing notes, those only of our plants which possess this quality will be touched upon.

The United States abound with vegetable productions having this characteristic, and perhaps no class of our native remedies is in more general use, not only in domestic practice, but also in that of medical men.

The first of the natural orders (following the classification of Lindley,) furnishing plants endowed with marked tonic properties is the RANUNCULACEÆ, in which are found:—the *Hydrastis canadensis*, the root of which is extremely bitter, and was a favourite febrifuge remedy among the Indians, and is still much used in infusion, in the western states, as a wash in chronic opthalmia; it, however, is by no means as powerful as the *Coptis trifolia*, the roots of which are intensely and purely bitter, and are thought by many to be fully equal to quassia. Bigelow states that larger quantities of it are sold in the druggists' shops in Boston than of almost any indigenous production. In this city it is but seldom resorted to, its place being supplied by the Virginia snake root. It has a great advantage of seldom or never producing any disorder of the gastric organs. It owes most of its celebrity, however, to its supposed efficacy in apthous and other ulcerations of the mouth. To this order also belongs the *Xanthorhiza apiifolia*, the bark of which, and especially that of the root, is exceedingly bitter. Dr. Woodhouse, who experimented with it, is of opinion that it is preferable to all our native bitters, being closely allied in its medical effects to the colombo; like the *Coptis*, it seldom disagrees with the stomach.

The next order that contains any plants worthy of notice is the MAGNOLIACEÆ, all the American species of which are possessed of more or less tonic properties. The various kinds

of *Magnolia* are all furnished with a bitter bark, and might be indiscriminately employed, though there is reason to believe that that of the *M. glauca* is the most powerful, the bark of this species being very extensively used in intermittents with the most unequivocal success; besides its bitter it has an agreeable aromatic taste, though Lindley states that no plant of this order is possessed of aromatic qualities.

Closely allied to the magnolia is the *Liriodendron tulipifera*, the bark of which is very analogous to it in all its sensible properties, except that whilst it is less aromatic and more pungent or warm, it appears to owe its medical powers to a peculiar principle discovered by Professor Emmet, (see Jour. Pharm. vol. iii.) From the experiments of Dr. Young it would appear that besides its tonic powers, that the liriodendron bark is endowed with no inconsiderable antispasmodic powers.

Many of the species of WINTEREÆ are aromatic stimulants; the most celebrated of these is the Winter's bark, for which we have an excellent substitute in the *Illicium floridanum*, a native of the more southern parts of the United States. The bark of this plant has a bitter, pungent and spice like taste and smell; sufficient experiments have not, however, been made with it to ascertain its true value.

The *Calycanthus floridus*, belonging to the *Calycantheæ*, judging from its sensible properties, is very analogous to the above, as its bark is aromatic and bitter, but the author of *Med. Flor. U. S.* asserts, we know not on what authority, that it possesses emetic qualities.

We do not meet with a native plant of tonic powers among the succeeding orders until we arrive at the ARISTILOCHIÆ; for although the *Hamamelis Virginiana* is said to be a mild tonic, and enjoys some reputation among empirics in the cure of dysentery, nothing positive is known respecting it. The ARISTILOCHIÆ, however, contain one of the most important of our native tonics, the *Aristilochia serpentaria*, whose remedial qualities are too extensively known to require any exposition of them from us. It may be mentioned, however, that several closely allied species are confounded under the common de-

signation of serpentaria; at the same time this is of little consequence, as there does not appear any difference in their remedial powers. In fact the whole genus is remarkably characterized by the conformity of the remedial qualities of the species composing it.

Several of the ROSACEÆ, as *Agrimonia*, *Geum*, *Rubus* &c. have also attracted attention as tonics, but as they more properly belong to the class of astringents, possessing little or no bitter principle, and apparently deriving their powers from the presence of tannin, they will not be considered at present.

The AMYGDALEÆ afford the large genus PRUNUS, the bark of all the species of which is more or less tonic and febrifuge; this is particularly the case with the P. *Virginiana*, which is extremely bitter and somewhat aromatic. This is a highly valuable remedy in a variety of diseases. It appears to act in a different manner on the system, than the other vegetable tonics, owing in all probability to the presence of a small portion of hydrocyanic acid. When administered in large doses it is very apt to excite vertigo.

The class of URTICEÆ presents some striking anomalies among the plants composing it; as to their medicinal qualities, the only one of them which can be considered as a tonic is the well known *Humulus lupulus*, which owes its peculiar action on the system to a resinoid secretion from the strobiles and young leaves, discovered by Dr. Ives, and termed by him *Lupuline;* this substance is intensely bitter, and also is endowed with no inconsiderable narcotic properties.

Almost the whole of the species forming the SALICINEÆ are medical, their bark usually being astringent, tonic and febrifuge, and has been for a long time used in paroxysmal disorders. Within a short time, however, this group of plants has attracted more attention, from the discovery that they afforded a vegeto-alkaloid analogous to quinine in its curative efforts. The only native species that has been much employed is the POPULUS *tremuloides*, the bark of which has acquired no slight reputation in the cure of intermittent fevers.

With regard to American plants belonging to the HIPPOCASTANEÆ, little definite is known; as, however, their bark is

very analogous to that of the Esculus *hippocastanum*, so highly praised by numerous writers in the treatment of diseases of an intermittent type, it is most probable that our indigenous species will be found possessed of similar good properties.

The class Polygaleæ is characterized by the bitterness of its species, and in the Krameria possesses one of the most powerful vegetable astringents with which we are acquainted. The only native species, however, which has attracted notice for its tonic properties, is the *Polygala rubella*, this is exceedingly bitter, and Bigelow in speaking of it states that he has been assured by those practitioners who have used it, that its infusion in small doses proved eminently useful. It in fact appears to be closely allied in medical effects to the *P. amara*, and *P. vulgaris*, of Europe.

The next class that requires notice is the Ilicineæ. The *Ilex aquifolium* of Europe, with which our *I. opaca* is closely allied, if not identical, has lately attracted considerable attention from the febrifuge powers of its leaves, which have been extensively experimented on by Dr. Rousseau, in France, with the most unequivocal success. No trials have been made with those of the *I. opaca*, but it is highly probable that they would be found equally efficacious. Another plant of this order, the Prinos *verticillatus*, has attained much celebrity as a tonic, but does not appear to deserve the eulogies it has received. Dr. Bigelow is of opinion that it is far inferior to a number of our other native remedies, and Dr. Darlington seems to think that it is entitled to but little confidence.

The great order of Compositæ furnishes numbers of plants highly celebrated for their tonic powers; it would lead us beyond all due limits to attempt even an enumeration of the species which have at different times been employed in medicine; we shall therefore confine ourselves to a notice of the most important of them, at the head of which stands the *Eupatorium perfoliatum*, every part of which is very bitter, and is used to fulfil many indications, as it may be so administered as to act as a tonic, a diaphoretic, or even as an emetic; when used for the first purpose, it is to be given either in powder or in cold decoction or infusion. The great ob-

jection to its employment is the disagreeable taste of all its preparations. Many other species of this genus are possessed of analogous properties, though none have come into such general use. The *Anthemis cotula* forms a substitute for the officinal chamomile, but its taste is much more nauseous, and requires to be given in small doses, as it is very apt to produce emesis. It is probable that many species of *Solidago* deserve attention as aromatic tonics, but the only one which has come into use is the *S. odora;* this although not properly a tonic, is entitled to notice, from the essential oil obtained from it, which although in common use in domestic practice in many parts of the United States, is seldom or never employed by physicians, though it is fully equal to most articles of its class imported from abroad.

As might be anticipated the order CINCHONACEÆ contains some indigenous species, having active tonic properties. Thus the bark of *Cephalanthus occidentalis*, has a highly aromatic bitter taste, not unlike cascarilla; that of the root is the most powerful. The article, however, which most closely resembles cinchona in all respects, is the bark of the *Pinckneya pubens.* This has long been used in the southern states, where it is indigenous, as a substitute for the Peruvian bark, with the most unequivocal success. From an imperfect analysis of it by Mr. Farr, it appears that it contains a large quantity of cinchonine. As in all probability it would form the best succedaneum for the foreign bark, it should be thoroughly experimented on, and we would draw the attention of our southern readers to this subject.

The CAPRIFOLIACEÆ partake in a great measure of the properties of the last order, the bark of most of the species being astringent or bitter; this is most remarkable in the genus *Cornus*, which affords a good substitute for cinchona, though it differs from it in some respects in its action on the system, as it often affects the bowels, more especially if administered in a recent state. All the species may be used, but the *C. florida* has been found to be the most powerful. It contains a vegeto-alkaloid, termed cornine, which, however, is in too small a proportion to be the only medicinal principle. From

experience it has been found that the bark is best given in combination with some other article, as the serpentaria or quassia.

The bitter order of the GENTIANEÆ is fully represented in the United States. Thus the root of the *Gentiana catesbæi* is very little inferior to the gentian of the shops, either in strength or efficacy, and it is probable that on trial many of our other species will be found equally medicinal. The root of the *Frasera Walteri* has received the name of American Columbo, and forms a good substitute for it, though Dr. Ives contends it is inferior to many others of our native tonics. It should be given in a perfectly dry state, as when recent it is very apt to prove emetic and cathartic. The *Sabbatia angularis* is well known throughout the United States, for its active tonic virtues, and deservedly holds a high rank as a febrifuge in intermittent diseases. Like the gentian it is a pure bitter, with no aroma or astringency, which is also the case with the *Menyanthes trifoliata*, the most of which in the opinion of Dr. Bigelow is fully equal in strength to imported articles of the tonic class, and may hereafter lessen our dependence on foreign drugs.

Among the SCROPHULARINEÆ it would scarcely have been expected that a tonic bitter should be found, and yet there is no one of our native plants which possesses the bitter principle more in abundance than the *Chelone glabra*. Rafinesque is the first author who has spoken of this plant, on the authority of the Shakers of New Lebanon. He states, and from trials made with it there is no doubt of the fact, that it is more intensely bitter, without aroma or astringency, than any of the articles heretofore mentioned. It, however requires a full investigation as to its real powers, as from the order to which it belongs it is likely that this bitter principle is joined, as in aloes, to some other of equal power.

Among the MONOCOTYLEDONOUS plants, there are few endowed with tonic properties; the *Melanthaceæ* affords the *Helonias dioica*, the root of which is of a nauseous bitter taste, and has been employed as a tonic in many parts of the United States; it is emetic in large doses, and is at best an unsafe

article. In the ASPHODELEÆ, however, is the *Aletris farinosa*, whose root is intensely bitter, affording a resin which resembles quassia in taste. It is mingled with some other principle which prevents it from being administered except in very small doses, an over quantity producing nausea and narcotic symptoms. The best mode of giving it is in infusion.

It will be perceived from the above list that nature has most amply furnished the United States with plants possessed of tonic properties, and although none of them are perhaps equal to the Peruvian bark, there are many that may be used as substitutes for this article, and still more that form admirable adjuvants to it.

ART. XLIX.—*Pharmaceutical Notices.*—No. 9.

THE beneficial effects which have followed the former publication of these notices, have induced us to record such occurrences as appeared worthy of notice, as they transpired in the regular routine of business. We now hand you a few in the hope of arousing an interest among the members of the profession for such details, from a firm belief that much valuable information may be derived from a source hitherto too much neglected. T. & F.

Iodine Liniment.—A phial of iodine liniment, prepared by adding one ounce of tinct. of iodine to eight ounces soap liniment, of a rich deep brown colour when made, became, after standing twenty-four hours, completely changed in its hue to the colour of soap liniment. The change is attributed to the reaction of the iodine upon the soda of the soap, by which it is converted into hydriodate of soda. This fact, if iodine be more useful than its salts, when externally applied should induce us to prepare the liniment in small quantities only, and immediately previous to its application. F.

Citrate of Potassa.—The use of this salt as a substitute for the unpharmaceutic preparation by lemon juice and carbonate of potassa in neutral mixtures, induced us to prepare con-

siderable quantities of it. The following is a ready mode, and we believe has never before been recommended in print:—

Take of crystals of citric acid, powd. parts 9.50
" " salt of tartar (carb. potassæ) 11.

Combined and dried, at 212° they produce citrate of potassa, 16.62 parts.

The carbonate of potassa should be dried at a temperature of 212°, and the citric acid at a rather less heat. They must then be well rubbed together in a mortar. A few drops of ol. lemon, added, render the mixture very pleasant. T.

Chameleon Mineral.—We have in vain essayed to prepare this article agreeably to the directions of Henry and Webster's Chemistry, by the infusion of *nitrate* of potassa with black oxide of manganese, and mention the fact that others may not waste their materials and labour on this process.

Pure caustic potassa, fused with the oxide may be confidently relied on to produce the salt. F.

Sulphur Precipitatum.—The results of several analyses satisfy us that an *economical* practice is adopted by many manufacturers of this preparation of separating the lime of the sulphuret, by means of sulphuric instead of muriatic acid, and that consequently the pharmaceutist who does not prepare his milk of sulphur is administering from thirty to fifty per cent. of sulphate of lime in the place of that quantity of pure sulphur. F.

Extra Soda Water.—Five grains of bicarbonate of soda in a bottle of soda water with pine apple syrup, were found, during the last summer, to have changed the syrup into mucilage, in the course of twenty-four hours. The appearance of the contents of the bottle very much resembled cold flaxseed tea. The bottle was returned by the patient, who thought something had improperly been mixed with it. Two or three experiments with bottles similarly prepared, however, confirmed us in the opinion expressed at the commencement of this paragraph, that the change was owing to the action of the alkali on the sugar of the syrup. F.

Analysis of Coal.—Nitrate of ammonia is found to answer the best purpose in effecting the abstraction of the carbon,

for estimating the quantity of earthy matter. In the analysis of a bituminous coal, the gases having been previously removed by distillation, and the loss of weight ascertained, the coke is then mixed with dried nitrate of ammonia, exposed to a red heat in a crucible, and the carbon completely consumed. The loss of weight again ascertained gives the quantity of combustible matter, and the remainder in the crucible is the weight of earthy matter. This may appear a trifling detail to the practised chemist, but to a beginner we are convinced such a recital of details is of invaluable service. It is a kind of information in which the experience of every one has taught him, that the books are too deficient. T.

Crystals in Ext. Hyos. Nig.—It is well known that many of the extracts, particularly those which contain chlorophylline, gradually become hard, and present in their interior and more especially on their exterior surface, small, though well defined crystals. This is frequently the case with the ext. hyos. nig., and according to Recluz, these are of two kinds; nitrate of potassa, and chloride of sodium. Having occasion lately to examine a specimen of this extract, I discovered in it, beautiful white transparent crystals, which on analysis proved to be nitrate of soda. The spontaneous formation of these crystals in the different extracts, is deserving of attention; for we often, as in the case just cited, find them composed of bodies which we are unable to detect in the plant from which these extracts have been made.

Adulteration of Sulphate of Quinine.—Among the numerous adulterations to which the imported sulphate of quinine is liable, is that by salicine, which is now manufactured on a large and at a cheap rate in Europe. This adulteration may be detected by means of concentrated sulphuric acid, which decomposes the salicine, forming a purple coloured fluid. The acid should be concentrated, as the diluted acid of the U. S. Pharmacopœia has no effect.

Extracts Belladonnæ and Hyoscyami.—Geiger and Hespe have found that the best method of preparing these extracts

of a uniform strength, is to exhaust all the virtues of the fresh or dry plant with cold water; to separate the clear fluid, reduce this to the consistence of a syrup, treat this with alcohol, which is afterwards to be distilled off in a water bath. From experiments, it is proved that the extract made from the dry plant is fully as powerful as that from the fresh.

L. F.

Extractum Humuli.—The American Dispensatory justly observes, that since the discovery of lupuline, this extract has not been deemed an eligible preparation. Was it ever an eligible preparation? Does not the heat required to evaporate the decoction deprive it of most of its active principles? That it contains a vast proportion of inert matter may be judged from the fact mentioned by Brande, that one cwt. of hops will afford forty of extract.

Oleum Tiglii.—One of the neatest modes of administering this energetic purgative, is the form of an alcoholic solution, in the proportion of eight drops of the oil to an ounce of alcohol. Dr. Nimmo gives the following formula for a mixture which he has found very efficacious:—

R. Solut. alcohol ol. tiglii		3ss.
Syr. simp.		
Mucil. acaciæ	*a a*	3ii.
Aquæ distill.		℥ss.

A little milk to be taken before and after swallowing it.

Oleum Valerianæ.—As the virtues of valerian appear to depend on its essential oil, which is of a greenish white colour, and volatile, ought not this preparation to be recognized in our pharmacopœias and dispensatories. It is so in those of the continent of Europe, and in Germany is preferred to almost every other preparation of valerian. It is prepared in the usual manner by distilling the root with water. There is, however, much diversity of opinion as to the proper proportions of these. Thus the Belgic and Russian pharmacopœias order merely *q. s.* of water; the Hanoverian, Polish, Prussian and Saxon, four parts of water to one of the root; the

Bavarian nine of water to one of root, and the Austrian twelve of water to one of root.

Lupuline.—Mr. Raspail states that it is an erroneous idea to suppose that the bitter principle of the hop resides in the pollenic glands alone. All the leaves and even the stems afford it; in fact, the young leaves will furnish almost as much as the strobiles. G.

Tartar Emetic Plasters.—So far as I am aware, the attention of our apothecaries has never been drawn to the question of the best mode of making the above plaster. A very common practice is to sprinkle the tartar emetic on a Burgundy pitch plaster; but in this case the quantity of the tartar emetic is too small to have a complete effect, although sufficient to destroy the adhesive property of the pitch; and at best the latter is by its harshness excessively painful to the skin. Another way in which it is sometimes prepared, is by sprinkling the powder on a plaster of emplastrum resinæ; to which the first and second objections mentioned above equally apply. I believe the best method of preparing this very useful application, is to mix the tartar emetic with adhesive plaster, in the proportion of about three drachms to one ounce, and with this mixture to spread the plaster of the desired form and size. It is perfectly adhesive, without harshness, and very effective.

Unguentum Tartari Emetici.—The only formula for this preparation, to be found in the Dispensatory of the United States, is from the Dublin Pharmacopœia, which directs one drachm to one ounce of lard. This proportion appears to me too small, and is often indeed found to be long in producing the effect intended. I should propose two drachms to one ounce, and the tartar emetic to be previously reduced to an impalpable state by precipitating it from the saturated aqueous solution by alcohol.

Moxa.—On page 206, (et seq.) vol. ii. of this Journal, are some interesting and valuable observations by our corresponding secretary on various expedients for preparing moxas, none

of which appear to have been entirely satisfactory in practice. Perhaps the best there mentioned are the French moxas prepared by impregnating cotton with nitre; but these are subject to some inconveniences. I have lately prepared a moxa with a solution of bichromate of potassa, which appears to answer very well. It may be made in the following manner:—Macerate strips of coarse cotton or muslin in a saturated solution of the above salt; and when nearly dry roll them tightly on a piece of wire of the twentieth of an inch in thickness, until the cylinder shall be about three-fourths of an inch in diameter, or as thick as may be thought desirable. The roll must then be wrapped round very tightly with strong thread, and covered with a piece of fine muslin, stitched over it. The wire may then be withdrawn, and the cylinder completely dried. When wanted for use, a small piece of the requisite length may be cut off by a sharp knife, and fixed on the part by a piece of adhesive plaster, having a cross cut in the centre. This moxa burns with a more uniform and steady ignition than those prepared with nitre. W. H. jr.

ART. L.—*Note on Egyptian Opium.* By J. SCATTERGOOD.

A FEW months since, a large importer of drugs &c. in this city, received via Leghorn, a case of opium, which was invoiced and sold to many of our druggists as Egyptian. Its attractive appearance, being in small, flattened pieces, very dry, and free from the impurities with which good opium is very often contaminated, combined with its taste and strong narcotic odour, procured for it a very ready sale.

In operating upon a pound of it, with a view to obtain its morphia, I was struck with the very small product, and led at first from this circumstance and some peculiarities observed in its solution in water, to suspect that it might be a factitious production from some of the laboratories of Marseilles, where Guibourt says they make the opium over again. Upon referring, however, to his description of the Egyptian va-

riety, I find it corresponds with it, except in its odour, which is quite as strong as the Smyrna, whereas that of Guibourt was weaker.

A pound troy yielded by the Pharmacopœia process but 6½ drs. of impure crysals which were more largely contaminated with narcotine than the similar product of good Smyrna opium. Guibourt in ascertaining the product of the three kinds which he experimented upon, obtained from 4 oz. of each, (that is, Smyrna, Egyptian and Constantinople,) 2 oz. and 3 drs. of friable, watery extract, indicating a loss by the treatment of 59 per cent., whereas water took up of the pound I operated upon all but 3½ oz. which showed a loss of upwards of 75 per cent. He obtained of impure morphine from 4 oz. of the Egyptian variety 4 drs. 40 grs., very nearly three times the quantity I obtained; which is a very decided evidence of there being a very material difference in the two articles notwithstanding their similarity in other respects.

ART. LI.—*Medico-Botanical Notices. No.* 1.

[Under this title it is intended to give short notices of the botanical characters and pharmaceutical uses of such plants employed in medicine as are least known, or on which any thing new can be offered; they will not be confined to original notes alone, but advantage will be taken of all the information to be gleaned from foreign publications, though a preference will always be given to such communications as tend to elucidate our native remedies; and we earnestly solicit our subscribers to aid us in this undertaking, for however trivial the knowledge they possess of the history or qualities of any remedial agent may appear to them, the communication of this knowledge to others may prove of eminent importance, by supplying materials for a perfect account of our materia medica.—*Editor.*]

Anthemis *cotula.*—Having witnessed the prompt and decided efficacy of this plant as a vesicatory, and believing

that some good vegetable epispastic was a desideratum, my attention was early directed to it, as an article well calculated to supply the deficiency. It has received a variety of names in different sections of the United States, as wild chamomile, may-weed, stinking chamomile, and dog fennel. It is an annual, and abundant in most uncultivated fields, road sides &c. flowering from midsummer till late in the autumn.

Although the A. *cotula* has been extensively used in domestic practice, and even has enjoyed considerable reputation with some physicians as an internal remedy in various diseases, it has never been used as a vesicatory in this country; on the contrary some of our most eminent botanists have asserted that the greatest difference existing between the European and American plants was in the latter not possessing this power; and Dr. W. P. C. Barton states that it is likely that they are not identical, grounding this opinion on the greater activity of the foreign variety.

From my experience with it, however, and from the information I have received from several eminent practitioners, I consider the following conclusions fully established:—

1. That an application of this plant in a bruised state to the skin, will produce vesication, with as little irritation and as speedily as cantharides.

2. That it is more permanent in its effects.

3. That it may be employed in cases where cantharides would be injurious.

The vesication induced by the application of the A. *cotula* is readily healed, thus differing from those caused by most of the other vegetable epispastics, as the Ranunculus, Daphne &c.

The usual method of employing this plant when used as a vesicatory, is to collect the flowers and green branches, which are to be bruised or cut very fine, and applied in the form of a poultice. I am fully persuaded that an extract sufficiently active to induce vesication could be obtained, but have hitherto been unsuccessful in my experiments for this purpose. In a letter lately received from a distinguished physician, he states that he has employed the Anthemis for a

long time, and in a variety of cases, both in military and private practice, and that he has found it to vesicate in less time than cantharides, whilst the counter irritation thus produced was of a more permanent character.

Wm. Ashley, M. D. of Va.

Laurus *cassia and cinnamonum.*—Notwithstanding the length of time cinnamon and cassia have been known, and their great importance in a commercial point of view, the utmost uncertainty still exists whether these barks are the product of distinct species of plants, or owe their differential characters to culture, time of gathering, or to the part of the tree from whence they are derived. Garcias, who wrote in the sixteenth century, and from his situation of physician to the Viceroy of Portugal, had ample opportunities of becoming acquainted with the productions of India, declares that all the varieties of cinnamon are furnished by the same tree, and the same opinion was held by Monardes. Notwithstanding their positive declarations, the idea gradually gained ground that these barks were furnished by different species, and both Linnæus and Lamarck admitted the L. *cassia* and L. *cinnamonum* as well founded. Their authority for a long time was undisputed, although Thumberg who resided for a considerable time in the East, looked upon the distinction as unfounded. Of late years, however, botanists are inclined to admit that Garcias was correct in insisting on the identity of origin of these barks. In a letter from J. B. Batta, of Prague, to Mr. R. Brown, published in the last volume of the Transactions of the Linnæan Society of London, he expresses the difficulty he has experienced in tracing the synonyma of L. *cinnamonum* and L. *cassia*, and after a careful examination, is inclined to consider them the same; he also states that the plant usually found in collections under the name of L. *cassia*, is in fact the L. *malabathrum*, distinguished by its large, glossy, coriaceous leaves, divided calyx, and smaller fruit. The L. *javanensis* which yields the bark brought from Java, under the name of *Cassia lignea vera*, he also regards as a variety of the L. *cinnamonum*. The Chinese cassia lignea

bark, and the cassia buds of commerce, he thinks are the produce of an unknown species, distinct from L. *dulcis*, Roxburgh, and perhaps identical with a species in Mr. Lambert's herbarium marked L. *manillensis*.

Bergius long since asserted that the leaves known under the name of *malabathrum* were the produce of the L. *cassia*, whilst Paulet states they are derived from the L. *cinnamonum*. As to the Linnæan L. *cassia*, it is difficult to fix it with any certainty since he refers to two different plants figured in the *Hortus Malabaricus*, and in Burm. *Zeylan*, both of which have very acute leaves.

In fact from all that can be gathered on this intricate subject it appears evident that the L. *cassia* must be considered as a fictitious species, being merely a variety of the L. *cinnamonum*, or as supposed by Bergius and Batka the L. *malabathrum*. As respects the Chinese cassia, it may or may not be the product of an unknown species, but our present information on the subject does not warrant us in considering it as any thing more than a mere variety. It should be noticed that Blume has erected these plants into a separate genus, in which he is followed by Brown and Hooker. G.

ART. LII.—*On the active principle of Lobelia inflata. By* S. Colhoun, *Professor of Materia Medica in Jefferson Medical College, Philadelphia.*

The active principle of this plant is a brown, molasses like fluid, resembling in its physical qualities nicotine as prepared by Berzelius, tasting strongly of the lobelia, exciting the same peculiar pungency in the throat, which remains for some time, and requires repeated ablution to remove it. It is slightly deliquescent, becoming moist in damp states of the atmosphere; it is very indestructible by the common changes and temperature of the air, retaining the characteristics of the plant after remaining for three months in an open cup, exposed in a damp place to the heat of summer. It is very

soluble in alcohol; scarcely, if at all, in ether: in this respect it differs from nicotine: the active principle of the Lobelia inflata does not even colour ether to which it has been added.

Its natural colour is a deep brown, which is lightened by being treated with charcoal; it then becomes of a yellowish brown.

Lobelia forms salts with the acids; the tartrate of this principle is a deliquescent salt; saccharine in the appearance of its crystals, though not entirely distinct; they are brought to this state only by exposing them to the moderate temperature, at which water evaporates.

The sulphate exhibits much the same appearances, as also does the muriate; these salts are all deliquescent, retaining strongly the taste of the lobelia.

The process by which this active principle was obtained, was first by dissolving it in acidulated water, muriatic acid being used for this purpose; the menstruum continued to act upon the leaves for seven hours; it was then evaporated, the heat separating the superfluous acid.

Crystals, on the fluid being sufficiently reduced, were discovered on the bottom of the vessel; they were mixed with some foreign earthy salt, the existence of which was proved by burning the substance remaining after the evaporation in a small bottle kept for some hours in a red heat.

To avoid the salts thus formed with the acid, alcohol was used as the solvent; the extract remaining after its evaporation was beautifully transparent, and had the other properties above described. It was this extract that was principally used to form salts with the acids.

From a number of experiments made with the infusion, it is evident that there exists some superabundance of acid, which is probably the acetic.

ART. LIII.—*Some remarks on the Pottery used by the Aborigines of North America.* By Jacob Green, M. D., *Professor of Chemistry in Jefferson Medical College*

In a communication respecting some of the arts known and practiced by our aboriginal tribes of Indians, published in the second number of the present volume, I merely hinted at their wonderful skill in manufacturing earthen ware; my present object is to state some further particulars connected with this interesting subject.

When on a late visit to Wheeling in Virginia, I examined a number of specimens of earthen ware found in that neighbourhood; there appears to have been no ancient fort, camp, or military work in the immediate vicinity, but on the western bank of the Ohio river, on the very site of this flourishing town, there was once a village, a place of public worship, or perhaps merely the habitation of some distinguished chieftain. In proof of this, a few years since, a little to the north of the town, a *hearth* or fire place was discovered, not many yards from the bank of the river, and about four feet below the surface of the ground. The floor of the hearth was composed of large flat stones, and was strewed with pieces of charred wood and with ashes. There were no bricks,* or any earthen ware found near the place. This spot, I concluded, must either have been an *altar*, where religious rites were performed, or a *hearth* for the ordinary culinary operations of a family.

Some distance to the south of this altar or hearth, was the place of burial or *cemetery*. This was first noticed some years ago, by my friend, Dr. J. W. Clemens, an intelligent physician and a zealous antiquary, now residing in Wheeling. He informed me, that some workmen, while digging a cellar for him, in one of the principal streets of the town, observed a number of human bones, and some fragments of earthern ware. On offering them a small premium, they succeeded in getting out of the *tumulus*, three or four small earthen ves-

* I saw part of a brick found some miles farther down the river. Its surface was fluted, some mould being impressed upon the clay before it was burnt.

sels, and a number of arrow heads, stone axes, and rude ornaments of clay; enough of the skeleton was also ascertained to convince Dr. Clemens that it was buried in a sitting attitude. Two of the earthen vases, or urns, I had the pleasure of examining. One of them is in the possession of a gentleman in Wheeling, and the other is now deposited in the Lambdin Museum, at Louisville, Ky. They were all nearly of the same figure and capacity, and would contain about one quart.

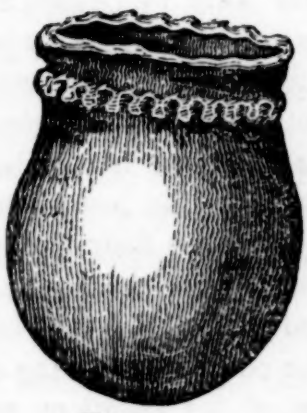

Fig. 1.

Fig. 2.

Figure 1, of the accompanying sketch, is an accurate drawing of the vase in the Museum. It differs from the others, in being ornamented on the outside near the brim, by a line of bead-like protuberances; the others were entirely plain. The symmetrical proportions of these vessels, and the smooth surface they present, render it highly probable that they were formed in a lathe, in the same manner as potters ware is now modelled. The inside of the urns appears to have been blackened either by smoke or the articles which they contained. The composition of which these vessels are made, is a mixture of talcose earth, clay, and pounded muscle shells, the unios of the Ohio river. They are without glazing, and have not been burned in a kiln, as our common earthen ware, but merely hardened by exposure to the sun and air, for by minutely examining the shells mixed with the clay, they were not in the smallest degree calcined; in most cases

the *nacre* of the shell is quite pearly and glittering. The vessels are capable of supporting, however, a high temperature, for Dr. Clemens boiled water in one of them.

There is a delicacy, perfection, and symmetry in most of the earthen vessels, found in the ancient tumuli of the west, which cannot be observed in any of the other articles which are usually disinterred with them. The stone axes, arrow heads, and other implements are often of the rudest construction. From this circumstance I think it probable, that the females, or the priests, or those whose ordinary occupations confined them at home, were the ancient American potters, and that the other articles were fabricated by men engaged in the bustle and business of war, or in the pursuits of the chase. In the Philadelphia Museum, however, there are some very curiously wrought instruments of stone, and among the rest a kind of tomahawk, made from a beautiful mass of translucent quartz. Perhaps this instrument was made and used by the priests, to immolate their victims.*

Dr. Clemens informed me, that two of the above vases, when first discovered, were filled with the bones of some small quadruped, and as far as he could identify the crumbling fragments, they were those of the *rabbit* or *squirrel.* They were deposited by the side of the deceased, that he might have, according to a traditionary superstitious notion, something to eat at the resurrection or reanimation of his body. This story, I have no doubt, is the invention of the present race of Indians, who now inhabit our western wilds. It has been the usage of many ancient nations, a usage which is, even now, scarcely obsolete, to bury in the same grave some symbol of the favourite amusement or occupation of the deceased. Thus, with the bones of the warrior, a battle axe will often be found, or perhaps his arrows and bow. Mr. Atwater, the indefatigable antiquary of Ohio, remarks, "that with the hunter is often interred, that kind of wild game of which he had been the fondest, or the most

* Many persons have supposed this tomahawk to be glass, but as I could not fuse a small fragment with the blowpipe without the addition of a *flux*, it is no doubt quartz.

successful in taking. Hence, the teeth of the otter are found in the grave of one, and those of the beaver in that of another." One who had been successful in fishing, is distinguished by a number of fish bones and muscle shells. If these opinions be correct, the ancient American, whose skeleton was found at Wheeling, must have been a famous hunter of the squirrel, or the rabbit.

In the Transactions of the American Antiquarian Society, vol. i. page 227, there is the sketch of a vase very much resembling the one we have given at figure 1, but it is more globose, better proportioned, and more highly finished; it was obtained in a mound, a few miles from Chilicothe. Dr. Hildreth, of Marietta, has also described a vessel, "nearly in the form of a cocoa nut shell," with four neat handles near the brim, opposite to each other; it was found in the bank of an island, not far from Belpre. These vessels seemed to have contained calcined human bones, and from their dark appearance, oil seems to have been poured into them along with the bones. In Pennant's Tour in Scotland, vol. i. plate 21, there is the representation of a fine urn, discovered in a cairn or mound, near the town of Banff. This vase is thought by Mr. Atwater, to resemble the one found near Chilicothe, and which is so much like our figure 1; but the likeness, in my estimation, is exceedingly remote. Yet though there is little similarity in the shape of these vessels, a variety of circumstances connected with them, intimate a great resemblance between the manners and customs of the people by whom they were manufactured and used. That the sepulchral rites of the early inhabitants of Scotland, were very analogous to those of the ancient tribes of Americans, who lived near Wheeling, must strike every one who reads Pennant's account of the urn of Banff. "It was discovered in a cairn or tumulus, in a coffin of flat stones; it was ornamented, but round it were placed three others, smaller and quite plain; the contents of each were the same, ashes, burnt bones, and flint arrow heads. There was also in the larger urn and one of the lesser, a small slender bone, four inches long, apparently not human, but the animal to which it belonged, and

the uses were unknown. The materials of the urn, consist of a coarse clay, mixed with small stones and sand, which have evidently been only dried and not burnt; the inside of the larger urn was blackened, probably with the oil from the bones." This is the substance of Pennant's account. It will be recollected that in the cairn at Wheeling, *one* ornamented urn and several plain ones were found, and that in several other particulars, that burial place resembles the one above described.

In the Philadelphia Museum, which is exceedingly rich in American antiquities, there are three very fine vases, composed of similar materials as those in the one above described. One of the vessels is from a mound in the state of Tennessee. It is in a globular form, with a short, thick neck, ornamented on the top with a good figure of an Indian's head. The orifice of the vessel is at the back of the head. It measures about twelve inches in height and about nine inches in diameter. The clay of which it is composed is of a light ash colour. The second vase is nearly spherical, and is in a high state of preservation; some large pieces of shell imbedded in the clay, preserve the pearly lustre of the nacre, so perfectly, as to settle the fact that it could not have been baked in the fire of a kiln. This was found at St. Genevieve, on the Mississippi. The third vase is an open pot, rudely ornamented on the exterior surface near the brim. Its locality is unknown. It is exceedingly desirable that accurate figures of these vessels should be engraved.

Figure 2 of our drawing, represents an earthen ware bottle found in Scott county, state of Mississippi, twenty feet below the surface. The clay is much purer, and the workmanship far superior to the Wheeling urns. It is of a dark umber colour, and was brought from the tumulus by my friend, Mr. S. of Pittsburg. In examining the smooth and polished surface of this beautiful vessel, it is scarcely possible to resist the inference that it was modelled in a potter's lathe. The drawing made of it, by the kindness of Mr. Lambdin, a promising artist and the liberal proprietor of the Museum at Louisville, will give a correct idea of its general appearance. It will

contain about a quart. The clay and the shells of which it is composed, must have been thoroughly beaten and worked together before it was moulded.

It is difficult to conjecture to what use this antique bottle was applied. It was most probably used in burial ceremonies, or was in some way connected with superstitious rites. I have seen some ancient Grecian lachrymatories, not very unlike it in figure; and perhaps the aborigines of the west, employed this vessel to gather the tears in honour of the dead. On the upper part of the body of the vessel, there are four representations of the head of some quadruped. When I first examined these rude specimens of sculpture, I supposed that the head of the animal intended by the artist, was that of the hog. The head of the *Sus tajassu*, or Mexican hog, cut off square, was found a few years ago, in a good state of preservation, in one of the saltpetre caves of Kentucky. Dr. Drake's notice of this curious circumstance, which I have just read, confirms this opinion; though an ingenious friend has supposed, that the head carved on the vase was that of the bear. The head mentioned by Dr. Drake, seems to have been preserved with superstitious care, with the same intent, probably, that the ibis and the beetle were embalmed by the Egyptians.

That bottles ornamented with various devices, were sometimes used by our aborigines, for idolatrous purposes, is quite certain, from the one found at Natchez, and now in the cabinet of the American Antiquarian Society, and also from the three headed bottle, discovered in a mound, on the Cumberland river. These heads are supposed by Mr. Atwater, to represent the three principal idols of India, Brahma, Vishnoo, and Siva. He, therefore, is of opinion, that the authors of our ancient works in the west, originated in Hindostan. These works, we know, are located near our principal rivers. "To the consecrated streams of Hindostan, devotees assembled from all parts of the empire, to worship their gods, and to purify themselves by bathing in their sacred waters. In this country, the sacred places of the aborigines were uni-

formly on the bank of some river, and who knows, but that the Muskingum, the Sciota, the Miama, the Ohio, the Cumberland, and the Mississippi, were once deemed as sacred, and their banks as thickly settled and as well cultivated, as are now the Indus, the Ganges, and the Burrampooter."

REVIEWS.

ART. LIV.—*The Dispensatory of the United States of America. By* GEORGE B. WOOD, M. D., *Professor of Materia Medica and Pharmacy in the Philadelphia College of Pharmacy &c. &c.; and* FRANKLIN BACHE, M. D., *Professor of Chemistry in the Philadelphia College of Pharmacy &c. &c. 2d. ed. Enlarged and carefully revised. Philadelphia.* 1834. *pp.* 1162. 8*vo.*

WHEN in the concluding number of our last volume we gave a review of the United States Dispensatory, we little expected, highly as we appreciated its merits, that we should be called on to notice a second edition of it within the year. There can be no better proof of the estimation in which a literary work is held by the public, than its rapidly passing through successive editions, and we trust that the learned authors of the United States, may every year be thus called upon for a renewal of their labours.

In the few remarks we have to make at the present time, we cannot do better than to transcribe their own observations in the preface, premising at the same time, judging from our necessarily hasty comparison of this edition with the last, that they have scarcely done themselves justice. "They have subjected the whole work to revision, correcting errors which occurred to their own notice, or were kindly pointed out by their friends, supplying omissions wherever observed, curtailing superfluities both of matter and expression, and occupying the space thus gained, by such additional facts and comments as appeared to them most likely to be useful." "The authors have had recourse, with advantage, to the recent volumes of Berzelius' great work on chemistry, and to several German treatises of high authority on botany, materia medica and pharmacy." Several new articles, as those on coffee,

tea and tannin, have been added to the division of materia medica, and in the appendix has been given a list of numerous drugs and medicines not included in the officinal catalogues, with brief descriptions, proportioned to their former or present importance, or to the degree in which they are related to medicine and pharmacy."

It would lead us beyond all due limits to attempt to point out and comment on the various alterations and additions that have been made to the work in this edition; it will be sufficient for any one to compare the first articles in each, (on gum arabic,) to be convinced that the authors have sedulously sought out and made efficient use of every thing of importance that has appeared since the date of their first publication. There is also another advantage this edition possesses, that of not being as unwieldy as its predecessor, for although containing many additional pages, from being printed on thinner paper it is of a much more manageable size. The only objection we have to make is to the appendix; most if not all of the information contained in it might have been incorporated in the body of the work, or if not considered of sufficient value to be thus disposed of, had better have been omitted.

ART. LV.—*Manual of Practical Toxicology: condensed from Dr. Christison's Treatise on Poisons; with Notes and Additions. By* J. T. Ducatel, M. D., *Professor of Chemistry and Pharmacy in the University of Maryland &c. &c. Baltimore.* 1833. *pp.* 341. 12*mo.*

We have been much pleased with this little work, which although it purports to be merely a condensation of Dr. Christison's admirable treatise on poisons, is entitled to take a higher rank than as a mere abstract. The matter is presented in so different a form as to present as much claim to originality as nine-tenths of the works of the present day.

Although it is chiefly designed for the use of medical men, we cannot too strenuously recommend it to the perusal of the

apothecary, who from his supposed practical acquaintance with most of the articles which are included in the long catalogue of the poisons, is liable to be called upon as a witness in cases of suspected poisoning; it therefore behoves him to be prepared to subserve the ends of justice and the interests of the community by a proper acquaintance with the facts contained in this work.

The arrangement of the subject matter is good; the classification is virtually that of Dr. Christison, but is an improvement on his, from the manner in which the subdivisions are constituted, which with the plan of numbering the paragraphs greatly facilitates a reference to any particular fact; and we may add, that there is that *sine qua non* of a good book, a copious and carefully prepared index.

"The notes and additions consist chiefly of explanatory observations on the text, which is to be understood as exclusively compiled from Dr. Christison's treatise; a tabular view of the class of irritant poisons, references to the chief pharmaceutical and artificial preparations, containing ingredients ranked among the poisons; fuller accounts of the mode of treatment for several poisons, principally as regards the chemical treatment by antidotes; descriptions of the botanical characters of the poisonous families of plants, of which the most common genera and species are mentioned, and those indigenous to America inserted, and their properties specified; and some additional facts concerning the singularly corrosive effects of chromic acid, and the poisonous properties of its salts."

To enable our readers to judge of the manner in which Dr. Ducatel has executed his task, we subjoin a specimen:—

Sect. III.—Of Poisoning with Copper.

1. *Of the Action of Copper, and the Pathological Symptoms it excites in Man.*

The salts of copper act in whatsoever way they are introduced into the system, and the more energetically, the more directly they enter the blood.

The symptoms caused by copper have at least two varie-

ties in their character. One class arises from its local action on the alimentary canal; the other from its operation on distant organs.

The symptoms caused by the soluble salts* of copper in man, are, in a general point of view, the same as those caused by arsenic and corrosive sublimate. But there are likewise some peculiarities.

The first symptoms may be violent head ache, then vomiting and cutting pains in the bowels, and afterwards cramp in the legs and pains in the thighs. Sometimes throughout the whole course of the symptoms there is a peculiar coppery taste in the mouth, and a singular aversion to the smell of copper.

Another symptom, which occasionally occurs in this kind of poisoning, and never, it is believed, in poisoning with arsenic or corrosive sublimate, is jaundice. Such are the symptoms when the case does not prove fatal.

When the poisoning ends fatally, convulsions, palsy, and insensibility, the signs in short of some injury done to the brain, are very generally present.

Besides these effects when introduced in considerable doses, and in the form of soluble salts, copper is said to produce other disorders when applied to the body for a long time in minute quantities, and in its metallic or oxidised state. But

* "It is pretty certain that copper, like all other metals, is not deleterious, unless oxidated, and that its soluble salts are by far the most energetic. The sulphuret is equally innoxious with the metal, if pure; but it appears probable that it becomes oxidated by long exposure to the air, and passes into the state of sulphate. The power of the oxides has not been ascertained: they are certainly poisonous; but they are probably not very active, on account of their great insolubility. The hydrated deutoxide is probably more active. But it is chiefly in the soluble salts that we are to look for the full development of the action of this poison. A very small quantity of the sulphate will prove fatal."—C.

The most common preparations of copper found in commerce, and in the shops are, acetate of copper, (*verdigris*,) binacetate of copper (improperly called *distilled verdigris*,) ammoniuret of copper, and *lapis divina*, which is a preparation of sulphate of copper, nitrate of potassa, alum and camphor, and is used as a collyrium.

the notions entertained on this subject must be received with some limitation.

2. *Of the Treatment of Poisoning with Copper.*

*Albumen** in the form of the white of eggs is the best antidote for the poisonous preparations of copper. *Ferrocyanate of potassa* is equally effective; and *metallic iron* is also a good antidote.

On account of its solvent power over the insoluble compounds formed by the salts of copper with animal and vegetable matters, vinegar, which has been frequently used, must be considered injurious rather than useful.

3. *Of the Morbid Appearances caused by Copper.*

The appearances found in the body after death, by poisoning with copper, are chiefly the signs of inflammation. If death takes place very rapidly, however, it is probable that no diseased appearance whatever will be perceptible.

When death ensues more slowly, the marks of inflammation coincide with the signs of irritation during life. Under such circumstances the whole skin, in a case related by Pul, was yellow. The *intestines*, particularly the lesser intestines, were of an unusual green colour, inflamed, and here and there gangrenous. The *stomach* was also green; its inner coat was excessively inflamed; and near the pylorus there was a spot as big as a crown, where the villous coat was thick, hard, and covered with firmly adhering verdigris. The *lungs* are likewise said to have been inflamed. The *blood* was firmly coagulated. In other cases related by Wildberg, the skin on various parts, and particularly on the face, was yellow; but on the depending parts it was livid. The outer coat of the stomach and intestines was here and there inflamed. The duodenum and jejunum, and likewise the gullet,

* Albumen, milk, tea and coffee, are supposed to decompose the solutions of copper. This has been doubted by some toxicologists, who recommended in preference the use of the stomach pump, and afterwards to reduce the excitement by blood-letting.

were in a similar state. The blood in the heart and great vessels was black and fluid.

The intestines have been found perforated by ulceration, and their contents thrown out into the sac of the peritonæum. A case is related where the small intestines were perforated, and several, where the perforation was in the rectum, which portion of the intestines, as well as the duodenum, jejunum and ilium, was also extensively ulcerated.

The existence of the *verdigris* in the form of powder, lining the inside of the stomach after incessant vomiting for three days, is of course an important circumstance in the inspection of the body. But too much reliance ought not to be placed on mere bluish or greenish colouring of the membranes. For it has been observed, that the inside of the stomach as well as its contents may acquire these tints in a very remarkable degree in consequence of natural disease.

Our limits will not permit us to notice a few points in which we are at issue with the author; there is one remark in a note to page 227, however, in which we think that Dr. Ducatel is mistaken; we allude to his attributing the salivation sometimes attendant on the medicinal use of hydrocyanic acid to the presence of mercury in that liquid. That it may contain a small quantity of this substance, when prepared according to the process of Gay Lussac, or of the Dublin college, we are ready to admit, but when the smallness of the dose of the acid is considered, we can scarcely credit that the infinitesimal proportion of mercury contained in these doses can affect the system, and must therefore still attribute the salivation to the acid, especially when we know that some of the other powerful acids, as the nitric, for example, are capable of thus acting on the secretory glands of the mouth.

ART. LVI.—*Botany of the Northern and Middle States; or a description of the plants found in the United States, north of Virginia, arranged according to the Natural System; with a Synopsis of the Genera according to the Linnæan System. A sketch of the rudiments of Botany, and a Glossary of Terms. By* LEWIS C. BECK, M. D., *Professor of Chemistry and Natural History in Rutger's College, N. J. &c.* Albany, 1833. pp. 471, 12mo.

A KNOWLEDGE of the internal resources of every country is admitted to be an object of the most paramount importance; now, as these depend in a great measure on its vegetable productions, we always owe a debt of gratitude to such of our fellow citizens as devote themselves to the investigation of our native plants. An ambitious naturalist may amuse himself with framing a new system, or in exploring the neglected wilds of a distant country; but those whose researches are guided by a love of utility, will better attain their aim by developing and elucidating the history and qualities of the productions of our own fields and forests.

Several valuable works have already appeared in this and in other countries on the plants of the United States, some on an extended scale, and others of a more local character. The publication which now solicits our notice is restricted to those native vegetables which are found in the states north of Virginia, and is intended, to use the words of its author, "to furnish a description of the plants of which it treats, adapted to the present state of botanical science."

With this view, he has followed the natural mode of arrangement, which has been so much neglected by our botanists; for although we by no means consider it as an unerring guide, it certainly opens new fields of inquiry, and enables us to arrive at conclusions which would never be attained by the sexual system. In the genera, some alterations have been made which in general are judicious, but in other cases appear to us as unnecessary.

We have neither the time nor the space to go into an ex-

amination of the work in detail, nor would it comport with the general character of these notices. There is one point, however, to which we would draw the attention of the author; as his work is intended as a text book for the beginner, it would have added much to its value if he had subjoined the derivations of the generic names; this has been done with success by Dr. Darlington, in his admirable Flora of Chester county.

We have noticed many errors of the press, and some of inadvertence, as in the introduction the same species in two places; but in the general, the work is correctly printed, and is of a convenient size. We can recommend it to the young botanist as a most valuable text book.

ART. LVII.—*Dictionaire de l'Industrie Manufacturiere, Commerciale et Agricole. Ouvrage accompagne d'un grand nombre de figures intercalees dans le texte &c. Tom.* 1*er. contenant* 174 *figures. Paris.* 1833. *pp.* 618. 8*vo.*

THE plan of publishing dictionaries or encyclopedias on all, or each of the sciences, has been more followed in France than in any other country, and has been attended with very advantageous results. In fact, few modes of diffusing knowledge are better adapted for the purpose than that of dictionaries; the information contained in them can be referred to without difficulty, from their alphabetical arrangement, added to which a variety of useful matter can be introduced into them, which would be out of place in any other species of publication. If well conducted, they give us an abstract or condensed view of the science or sciences to which they are devoted up to the day of publication, thus enabling the student to keep pace with the rapid advance of knowledge, without entailing on him the expense of a large library, or what is perhaps of equal importance, the loss of time required to collect from the numerous publications daily issuing from the press the few new facts each may contain.

The present work takes a different ground from any other, for although allied in some respects to the *Dictionaire Technologique*, it embraces a wider field of action, as it professes to treat not only of the arts, and their alliances with the sciences, but also of the relations which exist between these arts and legislation, noticing also the effects of each on public or private health. It also gives an explanation of all the technical terms used in the different arts and sciences. This it must be evident, cannot fail of including the discussion of a vast number of questions of great interest to the chemist and pharmaceutist; indeed, the best articles in the present volume, as far as we are enabled to judge, are those on chemical subjects, and are principally from the pen of M. Gaultier de Chaubray; among these we would particularly notice that on the manufacture of sulphuric acid by the perpetual process; this is accompanied with plates exemplifying the buildings and apparatus, by means of which 300 of acid may be obtained from 100 of sulphur.

To such of our readers as are familiar with the French language, we can recommend this work with confidence, judging from the specimen before us, and the high attainments of its conductors.

SELECTED ARTICLES.

ART. LVIII.—*On the Filter Press of Real, its mode of action and inconveniences, and a more simple means of obtaining the same results.* By Messrs. Boullay, Senr. and Junr.

The best plan that has hitherto been devised to extract the soluble principles from vegetable powders, is the filter press of Mr. Real, yet this apparatus is seldom used from the inconveniences attending its employment.

This apparatus essentially consists of a long tin box to receive the moistened powder, and a vertical tube capable of containing a column of water to press on the powder. The fluid with which the tube is filled forces out that mixed with the powder, under a pressure corresponding to the height of the column. This very height is a serious inconvenience, and a column of mercury has been substituted, but without remedying the evil. Another drawback to the use of this instrument is that it is very liable to get out of order. The whole mode of action of the filter press may be explained as follows:—When a powder saturated with water, but not forming a paste with it, is placed in a recipient analogous to that of the filter press of Mr. Real, and a column of water is made to act on it, this water traverses the powder, driving before it the fluid with which this latter had been saturated, and completely replaces it without mixing with it. What advantageous results are to be obtained by a knowledge of this fact? Let us suppose a powder capable of retaining twice its own weight of water, as saw dust for example, be mixed with four times its weight of this fluid, this mixture stirred often for some hours, so that every portion of the powder may be moistened, and then we endeavour to collect the products by different processes to ascertain which is the most advantageous.

By simple expression in a cloth, we shall not obtain

three-fourths of the liquid used to moisten the powder. By means of a common press we will obtain exactly three quarters of it. By the use of the filter press of Real, on the contrary, a quantity of fluid equal to twice the weight of the powder will be separated, when the flow of it will be checked. If the column of water be now made to act on it, we will be enabled to obtain the remainder of the fluid originally added to the powder.

In fact, the advantage of Mr. Real's method over every other, consists in permitting us to extract to the last drop any fluid with which a powder had previously been saturated, and which had become charged with its soluble principles. It also consists in the use of the smallest quantity possible of a solvent, and the clearness or limpidity of the products.

Now these important results are wholly independent of the pressure of the column of water, for they may be obtained by the mere superposition and weight of the quantity of water necessary to completely displace the fluid originally combined with the powder; in short, by the weight of a volume of water equal to that of the fluid to be displaced. Thus, for example, if we place a powder saturated with water in a funnel, or moisten this powder in the funnel so as to saturate it, every drop in excess added at the surface will cause the escape of one at the bottom.

If a volume of water equal to that in union with the powder be added at once, it will displace the latter as completely and in the same manner as in the apparatus of Mr. Real. This result takes place with other fluids also, whatever may be their relative density; thus water will displace wine, and be displaced in turn by that fluid. Oil is displaced by water, though not entirely, and *vice versa*. Atmospheric air will partly displace water, but is wholly displaced by it, as may be proved by the following experiment:—If a powder be put into a funnel, and water cautiously poured upon it so as to cover its surface with two or three lines in depth, no air will escape through the fluid, but the whole of it will be driven off at the lower extremity of the funnel. The results are, however, somewhat different according to the nature of the fluids ope-

rated upon. Thus when the fluid in union with the powder and that used to displace it, are capable of mixing together, the displacement will be complete, and if any mixture of them does take place, it is so limited as not to affect the general result. But if the fluids are incapable of mixing together, the displacement will be incomplete; thus water will not wholly displace oil, except by repetitions of the process.

From what has been said, the simplicity and importance of this plan of obtaining the soluble principles of powders must be evident. All that is required is a funnel, the lower orifice of which is to be stopped by a dossil of cotton, the powder is then to be introduced and saturated with the desired solvent; after it has taken up the soluble portions of the powder, it is to be displaced by another portion of the same fluid till the powder is exhausted. It is necessary, however, to pay attention to the following rules:—

1. The powder operated on should not form a paste with water.

2. The displacement is rapid or slow in proportion to the tenuity or coarseness of the powder, and to the lightness or looseness with which it is pressed into the funnel.

3. The quantity of fluid retained is in proportion to the noncompression of the powder.

4. As a general rule, it is better to employ rather coarse powders, and to compress them but slightly.

5. The fluids are to be used hot or cold, according to the nature of products, and of the solvent employed.

6. To obtain the most concentrated solution, the fluid must be gradually poured upon the powder, and the products separated. The first portion that passes through is at the highest point of concentration.

Where it is necessary to operate with closed vessels, an apparatus resembling the French coffee pot (caffetière à la Dubelloy) is the best; it may be made of tin, porcelain &c. It should be noted that the recipient for the powder should be long, narrow, and terminated below in a conical form, which may be furnished with a stop cock, so as to permit a ready division of the products. If this stop cock be jointed to the

recipient by means of a glass tube, it will afford a sure mode of separating the fluids which are incapable of mixing together, where one has been used to displace the other.

In a subsequent memoir on the application of this process, Messrs. Boullay make the following just observations on the formulas for tinctures &c.:—"After having indicated the relative proportions of substances to be employed, the manner of operating, these directions usually finish with the words *strain* and *filter;* without taking into account the portion of fluid retained in the powders &c.; which is as fully saturated as any other part of it. When extracts are made, large quantities of the solvent are used, requiring a tedious evaporation &c." All this is remedied by operating by displacement, as is fully shown by the experiments of the authors on the different preparations of cinchona.

Journ. de Pharm. June and August.

ART. LIX.—*On the Aromatic Roots and Seeds of the Scitamineæ.* By N. J. B. G. Guibourt.

On the Costus.—Authors are divided on two fundamental questions respecting this root: is it the product of the C. *Arabicus.* Lin.; or of the C. *speciosus.* Willd.? Is it identical with that known to the ancients under the same name?

The root of the C. *speciosus,* which is the *tsjana kua,* Rheede, (Hort. Malabar, xii. t. 8.) the C. *Arabicus,* Jacquin, (Icon. plant. rar. 1. f. 1.) and probably also the Herba *spiralis,* Rumphius, (Amboyna, vi. t. 64.) has no analogy to the Arabian costus of our shops. The contrary opinion is founded only on the assertion of Commelin, who does not appear to know the last mentioned article, as he says it has a pleasant taste, and is fibrous: whilst on the other hand, Roxburgh, (Asiatic Researches,) Ainslie, (Materia Indica,) and Batka, (Journ. Pharmacie,) have all pointed out the differences which exist between the costus of the shops and the root of the C. *speciosus.* This latter is knotty or articulated, creep-

ing and producing many bulbs, has scarcely any taste, but a slight odour, and is furnished with a great number of fibres. The bark cannot be separated, but in time it becomes split into numerous threads, (Rheede.) The costus of the shops now, as formerly, is an almost perpendicular root, often times bifurcated at its lower part, not articulated or fibrous, terminated above by a collar and often presenting the remains of the stem, (Clusius Exot. 205.) Its smell is somewhat like that of the orris root, mingled with a goat-like odour. Its taste is bitter and slightly acrid.

Not only this root cannot belong to the C. *speciosus*, but also after having examined all the genera and species of the family of the Scitamineæ, as given in the magnificent works of Roxburgh and Roscoe, I would say that the costus of the shops does not appear to belong to any plant of this family. Mr. Batka, who is also of the same opinion, thinks that it may belong to an Irideæ. I mentioned to this gentleman, that a merchant of Paris bought, a few years since, at a very low price in London, about twenty pounds of costus, which had been lying in the East India Company's warehouse under the name of *iris root;* but on the one hand, this name might have been given it, from its odour; and on the other, the well known conformation of the roots of the Irideæ precludes our attributing the root of the costus to this family.

If I may hazard a conjecture, I would say that our costus appears to be the root of an Umbelliferæ, not that it must necessarily be that of the Pastinaca *opopanax*, which Matthiolus calls *bastard costus*, though perhaps those who have substituted the roots of the opopanax or angelica for the true costus, were nearer the truth than those who have attributed the latter to a plant belonging to the Scitamineæ. As to whether our costus is that of the ancients, it appears from the descriptions of Dioscorides, Pliny and Galen, that their root was derived from India or Arabia, and had a strong and agreeable smell, was moderately heavy, whitish, of a warm and somewhat bitter and acrid taste, and might be adulterated with elecampane. This agrees with our root, added to which Garcias states, it is the only one known to the Turk-

ish, Arabian and Persian merchants and physicians, under the name of *cost* or *costi*.

It is true, Dioscorides and Pliny have mentioned many kinds of costus, but their descriptions having been written at a distance from the native habitats of this root, it is probable that the others were adulterations of the true article, or substitutes for it, as at present we have three barks from America, called *costus acris*, *costus dulcis*, and *costus amarus*, which have no affinity with the true article.

Galanga.—The care taken by Ainslie in his *Materia Indica*, to distinguish the root of the greater galanga from the smaller, has proved to me that I have confounded (Hist. des drogues) under the former, two different roots. To elucidate this subject as much as possible, I will first state that Garcias only recognized two kinds of galanga, one (minor) coming from China, where it is called *lauandon*, and another (major) thicker, but of more feeble properties, from Java, where it bears the name of *lancuas*. Both are called *lanquas* in India. Rumphius has distinguished two kinds, the *major* and *minor*, of the former of which there are two varieties, a red and a white. The former of these is covered with brown pelicles, is red at the bulb which supports the stem, and of a dirty white within. The second is externally whitish, rarely spotted with red at the bulb, and white within. Both are about an inch and a half thick, hard, fibrous and yet somewhat succulent; they have an aromatic, somewhat pungent smell, and a burning taste; they are both equally ligneous, brown externally, and of a gray colour within.

According to Rumphius, the *galanga minor*, as known in Europe, differs from the *lanquas minor* of India. The root of this is knotty, solid and flexible, like the preceding, but is much smaller, being only about the size of the middle finger; it is neither brown nor red, and might be confounded with ginger by inexperienced persons, if it were not thinner and less flexible. Its taste and smell are similar to those of the greater kind, but stronger. Added to which, our author says, more than once, that the lesser galanga of the shops should not be

confounded with the *lanquas minor* of India, which is not red, but whitish, and he thinks none of it reaches Europe.

As before observed, Ainslie makes a great difference between the greater and lesser galangas. The first is the *lancuas* of Garcias, the *lanquas major* of Rumphius, and the root of the ALPINIA *galanga*, Willd. (MARANTA *galanga*, L.) It is brownish externally, white within, and of a smell and taste much weaker than the lesser galanga, which is the *lanquas kitsjie* of the Malays, and the *lauandon* of the Chinese; it is blackish brown externally, reddish within, and has an acrid aromatic, slightly bitterish and burning taste; Ainslie asks whether this root is derived from a *costus*, an *amomum*, or some other plant.

I possess the following kinds of galanga.

1. *Galanga minor*, lesser galanga, (Hist. des drogues,) two to four lines in diameter, of a blackish brown on the exterior, with fimbriated circular rings. This root is represented by Clusius, (Exot. p. 211. f. 2.) and by Rhumphius, (Amboyna, l. 5. t. 63. f. D.)

2. *Galanga medius*, or middle galanga, described in the *History of Drugs* as *grand galanga*, from its being known under that name in commerce. The only change to be made in the account of it, is that its size only varies from six to eight lines, and that it is not to it, but to the next species, that the name of *acorus* has been erroneously applied.

3. *Galanga major* of Ainslie, Geoffroy and Garcias. This root is one or two inches large, jointed or ramified, reddish externally, white within, and of very faint smell and taste of galanga; it is, however, very old. It is represented in Clusius (Exot. p. 211. f. 1.)

4. *Galanga levis*, (false galanga,) *History of Drugs.* This root appears to me to be represented in Rumphius t. 63. f A, hence I am inclined to believe that it is the G. *major* of Ainslie and Rumphius, gathered young. However this may be, these four kinds appear to me to constitute but two distinct species:

1. The G. *minor* and G. *medius* are probably produced by the same plant, which is but little known.

2. The true G. *major*, or root of the ALPINIA *galanga*, Willd., to which may be joined as variety the G. *levis* of the *History of Drugs*.

CURCUMA.—Mr. Fee has made a just observation respecting this root, that its *round* and *long* varieties are produced by the same plant, or by two varieties of the same plant, which appears to be the CURCUMA *longa*, Lin., and that even if they are the product of different plants, the round curcuma ought not to be attributed to the C. *rotunda*, L.; this plant is, in fact, generally regarded as the same as the *manja-kua* of Rheede, the ZERUMBED *claviculatum* of Rumphius, and the KÆMPFERIA *pandurata*, Roscoe, and these plants are entirely different from the true curcumas so well described in the admirable work of Rumphius.

According to this author, the *curcuma* and the *tommon* (Zedoary,) form a separate genus of plants, the species of which are often confounded together. He distinguishes two kinds of curcuma; one cultivated, the other wild. The first furnishes numerous varieties, which are divided into two subspecies, a *major* and a *minor*. The first (*Curcuma domestica major*) is a plant whose root produces four or five petiolated leaves, which appear to form a sort of stipe, and are about eighteen inches long, not including the petiole, and six inches broad. They are acuminate at both ends, marked with oblique furrows beneath, are glabrous, of a fine green colour, and odorous on being handled.

The flowers are not disposed in a close cone, arising from a naked footstalk, as in the gingers, but in a loose central head, formed of semi-concave, imbricated, open bractes, which are greenish at their edges; afterwards becoming of a pale brown, especially in the wild plants. The root is composed of three distinct parts—first, a central tubercle, placed directly under the scape, of the size of a walnut, and called by the Malays *kumjit*, which means, *curcuma*. From this tubercle arise four or five others, of about the size and form of the finger, giving an appearance of a half closed hand; these elongated tubes constitute the second portion of the root. The third is composed of radicles arising for the

most part from the central tubercle; they are about five or six inches long, and sometimes furnished at their lower extremity with a white tubercle, which is succulent, insipid, and resembles an olive in form. It is evident that these last mentioned tubercles do not form part of the tumeric of commerce; but Rumphius states that the central one is dried for sale as well as its digitate appendages. When deprived of an external pellicle, which readily separates, they are of a gamboge colour, and have a peculiar ointment like smell and taste, with a slight acrimony mixed with bitterness.

The *Curcuma domestica minor* is smaller than the preceding, its leaves being only fourteen inches in length, comprising the petiole, and four inches in breadth. They possess a very strong odour of turmeric; the root is formed of one or two central tubercles, surrounded by a great number of digitate and recurved appendages, themselves giving rise to others, thus forming a tuberculous mass of some size. The digitate appendages are thinner than in the former species, and when deprived of their pellicle and fibres are smooth, as if polished by art. Internally they are of a dark yellow, have a mild but permanent taste, and a peculiar aromatic odour; a slight acrimony, but no bitterness.

Rumphius then describes the *wild curcuma*, whose root is only divided into two or three nodosities, with no digitate appendages, but having a great number of fibres or radicles, to which are attached round tubercles, resembling filberts. The root is yellowish gray externally, whitish within, with a yellow centre, almost inodorous and of a bitterish taste. It is not made use of.

The turmeric of commerce is composed of three or four kinds of tubercles, namely:—

1. *Curcuma rotunda.*—Round, oval or turbinate tubercles, about the size of a pigeon egg, of a dirty yellow colour externally, and of that of gamboge within. Every tubercle when entire is furnished near one of its extremities with a certain number of concentric circles or rings, which are the vestiges of the insertion of leaves, and at the other extremity with cicatrices arising from the rupture of the lateral appendages.

It is therefore evident that these tubercles are the *mother of curcuma* of Rumphius; and their resemblance with gamboge, their odour, ointment-like taste and slight acrimony mixed with bitterness, demonstrate that it must be referred to the *curcuma domestica major.*

2. *Curcuma oblonga.*—Elongated tubercles, which from their colour, smell and taste, evidently belong to the same root as the above, and are only its lateral appendages. These are not cylindrical as in the next kind, but are always largest in the middle, so that they present an ovoid appearance, between that of No. 1 and No. 3. There can be no doubt that they are the lateral appendages of the root of the *Curcuma domestica major.*

3. *Curcuma longa.*—Cylindrical tubercles, longer than the preceding, sinuous, not thicker than the little finger, externally gray, sometimes a little greenish, never yellow, internally of so deep an orange as to appear red or brown, more aromatic than No. 1, resembling ginger; taste very aromatic with no bitterness. These are furnished by the C. *domestica minor.*

4. Finally, we find in the turmeric of commerce, round tubercles about the size of a filbert, presenting vestiges of two foliaceous stripes, externally resembling the preceding and having the same properties. These are the main roots of No. 3.

I think it indispensable that the systematic name of these two varieties of the plant should be changed. The name of C. *domestica* is not sufficiently distinctive, and is as applicable to a Zedoary; that of C. *rotunda* or *longa* is still worse, not only because the same plant produces both, but also from the uncertainty caused by the Linnæan nomenclature.

In fact, in the first editions of the *Species Plantarum*, the C. *domestica major* is given as a synonyme of C. *rotunda*, whilst in all the others the C. *rotunda* is considered as identical with the *manja-kua*, Rheede, (*Kæmpferia pandurata*, Roscoe,) and the C. *domestica major*, given as a synonyme of C. *longa.*

On the other hand, almost all authors give, as another sy-

nonyme of C. *longa*, the C. *radice longa*, Herrmann, (*Hort. Lug. Bat.* 208,) and it is evident that this plant, copied by Blackwell and Pomet, is not the true officinal turmeric. Finally, Jacquin and Murray have recognized the true plant of Rumphius, and separated it from C. *longa*, under the name of *Amomum curcuma*, but as it is a *Curcuma* and not an *Amomum*, the name of Jacquin cannot stand. Considering therefore that this species is distinguished from all the others by the abundance of its colouring principle, and by its use in dying, I propose to give it the name of C. *tinctoria*, and the only synonymes of it I know are:—

Amomum curcuma, Jacquin. *Hort. Vindebon*, 3. t. 4. Murray, *Syst. Veg.* ed. 15.

C. *radice longa*, Zanon. Hist. Plant. t. 59.

C. *domestica major* and *minor*, Rumphius. *Amboyna*, v. 2. p. 162.

Zedoary. Zedoary was unknown to the ancients, without it be the same, as is supposed by some authors, with the *Syrian costus* of Dioscorides. It would be idle at the present day to attempt to decide this question; it is enough to say that our round zedoary is described by Serapion under the name of *zerumbet*.

The long zedoary, which is perhaps the *geiduar* of Avicenna, has been for a very long time the most common in commerce, and is the only officinal kind. The round, on the contrary, was very rare in the time of Clusius, who having seen it in Antwerp, described and figured it. At present, the round kind is almost the only one found in Paris.

Many authors have considered the two zedoaries as parts of the same root; among others, Pomet, Dale and Bergius. In the History of Drugs I have combatted this opinion, grounded on the fact that we sometimes see the round zedoary furnished with short round prolongations, which were not the long zedoary, but having lately examined the numerous *curcumas*, figured by Roscoe, I perceived that the same plant *might* produce both kinds of roots, the round being the large tubercles named by Rumphius *matricis radices*, and the long, the digitate appendages attached to the former. On the

other hand, so many of these plants furnish similar roots, among others the C. *zedoaria*, C. *aromatica*, C. *amada* &c., that it is difficult to say whether one of them exclusively produced the two zedoaries of commerce, or whether they were not the roots of different species.

Linnæus, in accordance with the authors that preceded him, attributed the round zedoary to the *Colchicum zelamicum* of P. Hermann, (*Malan-kua*, Rheede,) to which he gave the name of Kœmpferia *rotunda;* but if we compare our round zedoary with the roots of *Kœmpferia* and *Curcuma* we will be convinced that it can only be the central tubercle of the root. Anteriorly to Linnæus, Hermann described the true zedoary in his *Hort. Lug. Bat.* under the name of *Zedoaria zeylanica camphoram redolens*, and at a later period, Bergius received it from Cochin China, where it had been collected by Loureiro, and recognized it as the *kua* of Rheede, and called it *Amomum scapo nudo, spica laxa truncata.* This plant has successively become the Amomum *latifolium*, Lamarck, Amomum *zedoaria*, Willdenow, Curcuma *zerumbet*, Roxburgh, and finally Curcuma *zedoaria*, Roscoe.

Ainslie, in his *Materia Indica*, distinguishes three species of zedoary, but appears to me to be completely mistaken as regards them.

1. *Zedoary of Kœmpfer*, or round zedoary, produced by the Kœmpferia *rotunda.* I have just said that our round zedoary cannot be derived from this plant.

2. *Zedoary zerumbet*, produced by the Curcuma *zerumbet*, Roxburgh, which Ainslie has made synonymous with the Amomum *zerumbet*, Wildenow, and the *lampujum*, Rumphius. The error here consists in the C. *zerumbet*, Rox., which really produces the zedoary, being synonymous with the *Am. zedoaria*, Willd., whilst the *Am. zerumbet*, Willd., or *lampujum*, Rumphius, produces a root which has been described under the name of *zerumbet*, but it is not now found in commerce. All the rest of the article partakes of this confusion, and M. Fee commits the same errors in his article *gingembre zerumbet.*

3. *Turmeric coloured zedoary.* This root must be our yellow zedoary, it is erroneously considered by Ainslie as the

long zedoary of the Edinburgh Dispensatory; but this, notwithstanding the dark colour of its interior must be identical with our long zedoary. Ainslie attributes this kind to CURCUMA *zedoaria*, Roxb. (C. *aromatica*, Ros.) I am doubtful of this, for the faint yellow colour of the root of this plant does not appear to correspond to that of the yellow zedoary; besides there is another plant which produces it.

Roscoe also states, that Sir J. Banks is of opinion that the root of C. *zerumbet*, Roxb. was the true zedoary of the materia medica, and that the root of C. *zedoaria*, Roxb. was the round kind. Thus Roscoe admits that the long zedoary is produced by the C. *zerumbet*, Roxb. which he therefore terms C. *zedoaria*. But I know not why he is inclined to attribute the round zedoary to the KŒMPFERIA *rotunda*. If this plant produces a zedoary, it certainly is not the round zedoary of commerce. The following are the most certain synonymes of the two zedoarias.

1. *Zedoaire longue*, Hist. des drog. simp. No. 174.

Zedoaria longa, Matthiolus, Lemery, Bauhin, Dale and Geoffroy.

Zedoare, Pomet.

Curcuma zedoaria, Roscoe.

C. *zerumbet*, Roxburgh.

Amomum zedoaria, Willdenow, *Species Plantarum.*

A. *latifolium*, Lamarck, *Ency. Met.*

A. *scapo nudo, spica laxa truncata*, Bergius, *Mat. Med.* 4.

Tommon itam, Rumphius, *Amb.* v. 169.

Kua, Rheede, *Hort. Mal.* 11. t. 7.

Zedoaria zeylanica camphoram redolens, Hermann, *Hort. Lug. Bat.* 636.

2. *Zedoare ronde*, Hist. des drog. simp. No. 273.

Zerumbet, Serapion, Pomet.

Zedoaire ronde, or *zerumbet*, Lemery.

Zedoaria rotunda, Matthiolus, Dale and Geoffrey.

Z. *rotunda* et Z. *tuberosa nigricans*, C. Bauhin, *Pin.* 36.

Z. *tuberosa*, Clus. *Arom. Hist.* 1. c. 43.

YELLOW ZEDOARY. This root, as described in the "History of Drugs," closely resembles the round kind, in its radicles and the disposition of its cylindrical prolongations. As

I then said, it must be derived from a plant of the same genus, and we have seen that Ainslie attributes it to the C. *zedoaria*, Roxb., but I think that it is produced from the *Tommon*, Rumphius, v. 168. In fact it is difficult to find two descriptions which agree better than that in the History of drugs, and that of the *Tommon*, by Rumphius.

This plant is figured pl. 68, Rumphius, and has been erroneously supposed by many authors, and especially by Roxburgh and Roscoe, to be the same as the *C. zedoaria*, Ros. (*Kua*, Rheede;) it differs by its spike of flowers which springs from the midst of the leaves as in the true curcuma, whilst in the C. *zedoaria* the flowers are borne on a naked scape. A specific name should be given to this *tommon* which resembles greatly, it is true, the plant I term C. *tinctoria*, but differs from it in the enormous size of its leaves, and the different character of its root.

The long, round and yellow zedoaries, with ginger, and the two turmerics, are the only roots of this genus I have met with in commerce. It appears, however, that there are others which it is necessary to mention to remedy the confusion which has existed.

The first is the *zerumbet* or *Zingiber sylvestre*, Garcias, (*Arom. Hist.* t. i, c. 43, the *Zerumbet*, Geoffroy; the *Zingiber latifolium sylvestre*, Hermann, (Hort. Lug. Bat. 635;) the *lampujum*, Rumphius, *Amboy.* v. t. 64;) the *katou-inschi-kua*, Rheede, (*Hort. Mal.* t. 13;) the *Amomum zerumbet*, Linnæus, Jacquin (*Hort. Vind.* 3 t. 54) and Willdenow; the *Amomum sylvestre*, Lamarck; and the *Zingiber zerumbet*, Roxburgh and Roscoe.

The second is the *Cassumuniar* of Geoffroy, who thus describes it:—Root tuberous, of the size of the thumb, in transverse slices, and surrounded with circular lines like the galanga; of an ash colour externally, and yellowish within. This root appears to bear the same relation to the preceding that the yellow does to the round zedoary; it differs from it in colour; it appears to be the produce of the Zingiber *cassumuniar*, Roxburgh and Roscoe; a plant closely allied to their Z. *zerumbet*.

The third root in the *gedwar*, Clusius, (*Exot. auct.* 378.) The figure given by this author, who is always exact, does not permit us to confound the gedwar with any of the preceding roots. It is difficult to say whether it is the product of a *Curcuma* or a *Kæmpferia*.

Cardamoms. Independently of the five species of Cardamoms mentioned in the "History of Drugs," I have discovered a sixth, and this discovery has tended to elucidate this hitherto obscure subject. All these kinds of cardamoms being described or figured in many works, I shall restrict myself at present to the explanation of their synonomy, as every one can readily recognise the species by means of the descriptions and still better by the figures alluded to.

1. Round Cardamoms. *Cardamome rond.* (*Hist. des Drog.* No. 613.)

This species is accurately described by Pomet, p. 39, and faithfully represented by Clusius, (*Exot.* p. 377,) and by Elizabeth Blackwell (*Herbal*, t. 371.) On comparing these two figures which indicate a sessile fruit in close bunches, with the figures of the *Elettari*, Rheede, (*Hort. Mal.* ii. t. 4, 5, 6,) it is evident that this plant does not produce the round cardamom. The only plant that can and in fact does produce it is the *Amomum cardamomum*, Roxburgh, (*Pl. Corom.* 3, No. 201,) the *Cardamomum minus*, Rumphius, (*Amboy.* 5. t. 65. fg. 1.) It is also the *A. cardamomum*, Linnæus and Willdenow; but the synonymes taken from Rheede and Blackwell must be expunged.

2. Lesser Cardamoms. *Petit cardamome* (*Hist. Drog.* No. 614,) *Cardamomum minus* of Matthiolus, Clusius, Lemery, Pomet, and Geoffroy.

This fruit is represented by Matthiolus, Clusius, (*Exot.* 187,) Blackwell, (*Herbal*, fg. 22,) and not by Gœrtner, who, under the name of C. *minus*, appears to me to have figured the preceding species.

So many authors now agree that this cardamom is produced by the *Alpinia cardamomum*, Roxburgh, which is the *Amomum repens* of Sonnerat and Willdenow, and the *Amomum racemosum*, Lamarck, that I dare not oppose this opinion.

If, however, I followed my own bias, I should say that the lesser cardamom was the product of the *Elettari* 2, of Rheede, (11 t. 6,) the round fruits of which, destitute of any fibrous appendage, appear to me the only ones which would assume in drying, the rounded-triangular form of our lesser cardamom. This plant was called *Amomum grana-paradisi* by Linnæus, under an erroneous impression that they produced the grains of paradise, and he made a distinct species of it. Lamarck has only made it variety B of his *Amomum racemosum.*

3. Middle Cardamoms. *Cardamome moyen*, (*Hist. Drog.* No. 615.)

I do not know of another representation of this species than that of Blackwell, t. 584, fg. 17, 18, 19. Whatever may be its external resemblance with the preceding, it may always be distinguished by the whiteness of its shell, and the red colour of its seeds. The plant that furnishes it may only be a variety of the preceding.

4. Greater Cardamoms. *Grand Cardamome*, (*Hist. Drog.* No. 616.)

Cardamomum medium, Matthiolus, Pomet and Geoffroy.

C. *medium* seu *majus*, Lemery.

C. *majus officinarum*, Bauhin. *Pinax*, 413.

C. *majus vulgare*, Clusius. *Exot.* p. 187.

C. *majus*, Murray. *Apparatus*, v. 63.

C. *ensal*, Gœrtner. *Fruct.* t. 12.

Blackwell. *Herb.* t. 584, fg. 14, 15.

This fruit is well represented in Clusius, Blackwell and Gœrtner. In a German work entitled *Vollstaendige sammbung offizineller pflanzen*, I find it stated that the C. *ensal*, Gœrtner is a new species or variety which Roxburgh calls *Alpinia cardamomum medium.*

5. Elettari Cardamoms. *Cardamome elettari.*

At one time this kind must have been abundant in commerce, for I found at the establishment of Mr. Pelletier a jar almost full, which appeared to have formerly occupied a place in his shop, as if in common use. This cardamom is that represented, pl. 4, 5, Rheede, (see particularly fg. N. O.

pl. 5,) which show both the recent and dried fruit; these figures are copied in Blackwell, t. 385, fg. 1, 2, t. 584, fg. 5, and t. 585. Their striking resemblance, to these figures, whilst it pointed out to me the origin of these cardamoms, also convinced me that these figures could not represent the lesser cardamoms, as every author has hitherto admitted, and by a natural consequence, I doubted whether the *Amomum repens*, Sonnerat, *Alpinia cardamomum*, Roxburgh, which are so closely allied to the *Elettari* 1, of Rheede, produced it. Besides these two authors could not know exactly what we called *Lesser Cardamoms.*

This cardamom may be described as follows:—Shell of a reddish gray, darker and browner than that of the greater cardamoms; it always presents on its surface the vestiges of a dry fibrous husk, which is wanting in the other cardamoms. It is about ten to fifteen lines in length, and five to seven in breadth, having sometimes the form of a cocoa nut enveloped in its husk, and at others that of a clove of garlic. Many years since, these shells, deprived of their seeds, were given to me as those of the grains of paradise, and I described them as such in the second edition of the History of Drugs, No. 617. In this article, then, the description of the shells belongs to the Cardamon elettari, and that of the seeds to the grains of paradise. What led to this error is that the seeds of the C. *elettari* resemble greatly the grains of paradise, both in form and size. Thus whilst the lesser cardamoms has brownish seeds wrinkled at the surface, like cochineal, the middle cardamoms red seeds, and the greater cardamoms white and very angular seeds, the C. *elettari* has them more rounded and of exactly the same size as the grains of paradise; but their surface is of a dull grey colour, and their cardamom smell, and terebinthinate but not acrid or burning taste, range them among the cardamoms, and separate them from the grains of paradise.

6. Grains of Paradise. *Maniguette ou Graine de Paradis. Cardamomum majus*, Matthiolus, Pomet and Geoffroy.
C. *piperatum*, Cordus. The best name for this species.
Grana paradisi officinarum, Bauhin, *Pinax*, 413.

Amomum angustifolium, Sonnerat. Voyage aux Indes, t. 137.

A. *madagascariense*, Lamarck. *Encyclop. Met. Bot.* 1. p. 133, t. 2, fg. 1.

Zingiber meleguetta, Gœrtner. *Fruct.* t. 12.

Blackwell, t. 584, fg. 10, 11, 12, 13.

The figures of Sonnerat, Lamarck and Gœrtner, represent the recent fruit, those of Blackwell the dry. I think that the figure given by Clusius, (*Exot.* 37, fg. 314,) also refers to the same fruit, notwithstanding the differences pointed out by the author, which I believe to be accidental. The same may probably be said of pl. 584, fg. 9, of Blackwell as also of pl. 385, fg. 4 and 5 *ter* of the same author, though it is possible that these latter may belong to some closely allied species.

The dry capsule of the grains of paradise, is oval, presenting three obscure rounded angles, is about 18 lines long, as thick as the thumb, and terminated above and suddenly by a fibrous prolongation, about three or four lines thick and six long, well represented in Blackwell, t. 584, fg. 10. This capsule is grayish-brown externally, rugose, and, as if formed of a thin dried husk, it is about a quarter of a line thick, firm, polished internally, and divided into three cells, by three thin membranous partitions, which unite at the axis. These membranes on being separated from the capsule, let us see that this is filled with a single dry, white, pulpy mass, described by Lamarck, (Encyclop. Met. i. 33,) and well represented by Blackwell, (t. 584, fg. 12,) containing in as many small separate cells, angular, rounded, red seeds, having an unequal, shining surface, inodorous, and of a peppery taste.

I confess, that after having ascertained so exactly the plant and fruit of the *grana paradisi*, described by the above cited authors, I cannot understand how Mr. Batka should promise to publish the plant which furnishes the *true* grains of paradise, viz. the *Amomum grana paradisi* of Azfelius, (Journ. de Pharm. 16, p. 296,) for if this *amomum* is that of Linnæus, it is only the Elettari 2 of Rheede, and the seeds of this are certainly not grains of paradise. What surprises me still

more is, that Mr. Batka appears to think that the grains of paradise differ from the ancient *Cardamomum majus*, with shining seeds. I think they are the same.

I also regret to be obliged to say that Roscoe is in error in congratulating himself on having been the first to publish the plant which furnishes these seeds. Even in admitting that the *Amomum meliguetta*, Roscoe, cultivated at Demarara, produces similar seeds, it is not less certain that the A. *angustifolium*, Sonnerat, produces the true article, and as this plant grows in places from whence we derive the grains of paradise, it is evident that the verification of the fact and the priority are in favour of Sonnerat.

Jour. de Chim. Med.

ART. LIX.—*On the influence of Oxygen in the preparation of Volatile Oils and distilled Waters.* By J. S. Desmarest.

It was long since remarked that certain plants afforded more volatile oil before than after they had been dried. This was verified by Baumé as regarded the *origanum*. On the other hand, it was also found that in the distillation of fresh plants it made a difference whether the operation was commenced with cold or with boiling water; in the first case more volatile oil was obtained, and the distilled waters were turbid, whilst in the second case, less volatile oil was afforded, but the distilled water was limpid and odorous. I am ignorant whether a satisfactory explanation of these facts has ever been given, and hazard the following, hoping it will merit the approbation of chemists.

It is generally admitted that the separation of volatile oils by distillation is a mere effect of saturation; hence when an excess is obtained, it is assumed that this excess existed in the plants. This opinion is founded on the idea that distilled waters are merely solutions of volatile oils, and supposes that we obtain these bodies, without alteration, but if

we reflect on the extreme facility with which volatile oils are altered by contact with oxygen, we will be led to the conclusion that this effect is much less limited than has been supposed, and that it commences the moment this contact takes place; hence nothing will prevent our assuming that the separation of volatile oils is owing to the insolubility thus communicated to them.

Thus, when a dried plant is distilled with water, the volatile oil, having undergone an alteration by its prolonged contact with the oxygen of the air, and having thus become less soluble, more of it will be obtained. The same thing takes place, as regards fresh plants, if the distillation be commenced with cold water, the oxygen contained in the water combines with the volatile oil, alters it, and renders it insoluble, consequently it separates; but, on the contrary, if boiling water be used at the commencement, or what amounts to the same thing, if the fresh plants be subjected to the action of steam, the volatile oil is not altered, and it is completely dissolved in the water which distils over.

For the same reason, those volatile oils which are the most readily alterable, will afford the weakest distilled waters and *vice versa;* thus the turbid appearance of cinnamon, clove and mint waters, indicates that the volatile oil is imperfectly dissolved in them, whilst the clearness of rose water, and its powerful odour, evidently prove that it contains much volatile oil in solution. In fact the volatile oil of roses is one of the least alterable of this class of bodies.

Hence, it is evident, that the mode of distillation, the fresh or dry state of the plants, the quantity and temperature of the water, are all of consequence in the preparation of distilled waters and volatile oils, as they are capable of exercising much influence on the quality and quantity of the products.

Another deduction from the opinion above stated is, that the difference of colour, weight and viscosity presented by oils from foreign substances, may be the result of their alteration, and that these oils prepared from fresh plants would probably possess qualities differing from those usually as-

cribed to them. For the same reason it may be possible to obtain the highly volatile oils by distilling the fixed oils impregnated with them, in vacuo, and without the addition of water; finally, it may be questioned whether the volatile oils are not always the result of the alteration of more subtle principles wholly unknown to us, which are characterized by their great solubility in water.

Journ. de Pharm. March, 1832.

ART. LX.—*Apparatus for transferring a liquid from a carboy or cask, to bottles, especially useful in the case of sulphuric acid, the decanting of which is always more or less dangerous to the manipulator, especially as detached globules may reach the eyes.* By ROBERT HARE, M. D., *Professor of Chemistry in the University of Pennsylvania.*

By means of a treadle T, the rod R, and platform P, the bottle is, by the foot pressed against a brass disk D, coated with gum elastic. In the centre of this disk are two holes,

one of which receives a leaden tube communicating with an exhausting syringe S, while into the other hole another tube is soldered, which extends to the bottom of an adjoining carboy of sulphuric acid. By means of the syringe, the bottle being exhausted, the contents of the carboy are forced into it by atmospheric pressure.

The gum elastic being stretched over the disk, is secured by a clasp which is fastened round the periphery by a screw.

This apparatus may be employed to raise liquors into a bar room from casks in a cellar, with this advantage over the pump now used for that purpose—that the liquor does not pass through a pump. It has only to come into contact with a pipe of from one-fourth to three-eighths of an inch in bore.

The attachment to the cask is easily made by a gallows screw soldered to the nozzle of a cock, or simply to a ferule which may be driven into a cork hole, punching the cork before it.

The foaming of fermented liquors would be promoted by the exhaustion, lessening, for a time, the atmospheric pressure on the carbonic acid.

Journ. Frank. Inst. Oct. 1833.

ART. LXI.—*Remarks on the Memoir on Ipomæa jalapa, by* D. B. Smith, (*Jour. Phil. Col. Pharm.* vol. ii. p. 22.) By N. J. B. G. Guibourt.

Mr. Smith fully proves that the *Ipomæa macrorhiza*, Mx., which is also the *Convolvulus jalapa*, Linné and Desfontaines, does not produce the true jalap, but I think that he is mistaken in supposing that this plant produces the mechoacan, for, independently of other reasons, which will be hereafter adduced, if, as is remarked by Mr. Smith, the I. *macrorhiza*, whose root sometimes weighs 50 or 60 pounds, cannot produce the jalap of commerce, which never attains this size, it is evident that this plant does not afford the mechoacan, which is generally smaller than jalap.

According to the quotation of Mr. Smith, from the American Dispensatory, the first author who described the jalap was Monardes, who in his "History of Drugs brought from America," published in 1570, "pointed out the difference between jalap and mechoacan, and gave a clear and well defined description of these two roots." We might expect from this to find a good description of jalap in the work of Monardes, but this root is not even named in it, and we only find an imperfect account of three species of mechoacan:—

1. *Mechoacan.* A root found twenty years ago in the province of Mechoacan, (now Valladolid,) situated eighty miles from Mexico. The plant produces many flexible branches, which climb up poles or trelices, and cover them with their multiplied convolutions; the leaves are rounded, terminated in a point, petiolate, large, fibrous, and so thin that they appear to have no juice. The fruit is about the size of a dry coriander seed, collected in bunches; the root is thick, resembling that of bryony, so that many persons have thought these two plants to be identical, or at least closely allied; but they differ greatly as the root of bryony is very acrid, whilst the mechoacan is insipid.

2. *Mechoacan alterum.* They also bring us another mechoacan, which grows in the vicinity of Nicaragua and Quito, where it is carefully cultivated, and is much used on account of its admirable effects, which are far superior to that usually brought from New Spain. The flower resembles that of an orange, but is formed of five much larger petals; the fruit is the size of a filbert, having a thin, whitish envelope, and divided internally into two cells, each of which contains two seeds of the size of a small pea, which are black when ripe, and grow readily when planted in a light soil.

3. *Mechoacan sylvestris.* They also bring us from the promontory of Dona Helena, in the province of Nicaragua, another kind of wild mechoacan, which excites violent symptoms, as vomiting, colics and diarrhœa, on which account this mechoacan passes for a scammony, but no person has ever ventured to use it a second time. It resembles the other kind

in its leaves, its stems and root, but is smaller in all its parts, and its root has some acridity.

These last characters may, it is true, belong to jalap, but the first author who speaks of this root in a positive manner is Caspar Bauhin, who describes it in his *Prodromus Theatri Botanici*, published in 1620, under the name of *Bryonia mechoacana nigricans*, which appellation applies erroneously to the mechoacan, whilst it appertains to jalap, as is evident from the following description of Bauhin:—

Byronia mechoacana nigricans.—Root similar to mechoacan, but covered with a blackish bark, reddish within, round, cut into pieces of the size and form of a child's top, brought from the West Indies about eleven years since, (in 1609,) under the name of *chelapa* or *celapa*. The inhabitants of Alexandria and Marseilles call it *jalap* or *gelapo*, and it is regarded by the Marseillais as a sort of *black* or *male mechoacan*.

These observations on the memoir of Mr. Smith are trifling, but what I wish to impress is, that it is in fact owing to him that hereafter we ought never to confound the true jalap plant with the I. *macrorhiza* of Michaux, (*Convolvulus jalapa*, L.) for Dr. Coxe himself appears to believe in the identity of the two species, and has called the plant of the true jalap *Ipomœa jalapa, vel macrorhiza*, whilst the only name it should bear is the first of these.*

At the close of his memoir, Mr. Smith describes succinctly a fusiform and fibrous root, which appears to be as common in the American shops as in those of France, where it is known under the name of *Jalap leger*, (light jalap,) and is identical with that sent from Mexico to M. Chevallier by M. Ledanois, under the name of *male jalap*. I think that neither of these names are appropriate, as the latter is absurd, and as regards the former, we often find the true jalap lighter and less resinous than this pretended light jalap. The best method of designating these would be to call the true jalap *tuberous jalap*, and the other *fusiform jalap*, as their differential cha-

* Mr. Guibourt is mistaken; Dr. Coxe did not believe in the identity of the species, but intended that of macrorhiza as a synonyme.

racter resides in their form, which depends on a particular organization, which is the cause of the other differences between them, as the compact and conchoidal fracture of the tuberous jalap, and the long longitudinal fibres of the fusiform kind.

Since Mr. Ledanois sent the root of the fusiform jalap, he has transmitted to Academy of Sciences through M. de Humboldt, a specimen of the plant producing it, as well as of another plant which appears to be the true jalap, as may be deduced from the following extract of a report made to the Academy by M. Desfontaines:—

"These two species of jalap belong to the genus *Convolvulus*, their leaves are cordate; those of the male jalap are villous; those of the other are smooth, and terminated by a long point. Their corolla is of the form and size of that of the common bird weed, (*Convolvulus sepium.*) It is of a beautiful rose colour. These two plants differ from the common jalap cultivated in the *Jardin du Roi.*"

It appears evident to me, that the plant with smooth acuminate leaves, and rose coloured flowers is the true jalap, I. *jalapa*, (*Coxe,*) Smith. It is very probable however that the male or fusiform jalap, only differs from the former in the form of its leaves, which are villous and not longly acuminate. (The flowers appear the same.) Finally, there is no doubt, from the testimony of M. Desfontaines himself, that these two plants differ from the *Convolvulus jalapa*, L. or *Ipomœa macrorhiza*, Mx., the root of which is unknown in commerce, and is not the mechoacan.

This root has always appeared in the same form, in circular slices of from one to three inches in diameter at the most, or in elongated pieces, which apparently are portions of a fusiform root. It is white and farinaceous internally, inodorous, with a taste which is at first very faint, but afterwards slightly acid. It is always deprived of its bark, of which some yellowish traces only are perceptible; finally, what completely distinguishes the mechoacan from the two species of jalap, from the root of the *Ipomœa macrorhiza*, and from the decorticated tubers of the *Arum dracunculus* which it

closely resembles, are the brown spots, and the vestiges of ligneous radicles, which must be very numerous on the superfices of the root, as no part of the bark, however small it may be, does not afford indications of one or more of them. Any plant whose root does not present this character, is not the mechoacan, and it may be assumed that it is as yet unknown. *Journ. de Chim. Med. Sept.* 1833.

ART. LXII. *On Oxalhydric Acid.* By M. Guerin.

Properties. It has the consistence of a very pure syrup, is colourless, and tastes much like oxalic acid. Its density is 1416 at 75° F. It is soluble in all proportions in water and alcohol. It is very slightly soluble in cold or boiling ether; is very deliquescent; it precipitates lime, strontian and barytes water. These precipitates are dissolved by a slight excess of the acid. This character is also common to tartaric acid, from which it is distinguished by its not precipitating a concentrated solution of potassa, or a salt of that base; it, however, cannot be confounded with the malic acid of vegetables, which does not afford a precipitate with these salts. It precipitates the subacetate, the acetate, and the nitrate of silver in colourless flocculæ, and forms well characterized salts with salifiable bases.

Hydrated oxalhydric acid, permitted to stand in a glass stoppered bottle for a month, deposited crystals which had all the properties of the syrup-like acid. One part of this acid added to three parts of nitric acid, afforded in a month's time fine crystals of oxalic acid. One part of oxalhydric acid mixed with one part of water, and two parts of oxide of manganese, and two and a half parts of concentrated sulphuric acid, diluted with two parts of water, afforded formic acid.

Preparation. One part of gum arabic is to be mixed with two parts of nitric acid of 1339, diluted with half its weight of water, in a retort of four times the volume of the mixture, and provided with a tubulated receiver; a slight

heat is to be applied, till all the gum is dissolved; as soon as nitrous vapours appear, the fire is to be put out; a great disengagement of deutoxide of azote takes place; when this has ceased, the liquid is to be kept slowly boiling for an hour; then diluted with four times its weight of water, ammonia is to be added till it is perfectly neutralized, and afterwards a small quantity of a solution of nitrate of lime, so as to precipitate the oxalic acid, which almost always is found in a small proportion. The reddish yellow liquid having been filtered is to be precipitated by acetate of lead. This precipitate is to be separated by means of a filter, and washed until the fluid is not blackened by sulphuretted hydrogen. The precipitate is then to be decomposed by means of this gas, or by sulphuric acid diluted with six times its weight of water.

The acid thus obtained is of a yellow colour; it is to be evaporated over a gentle fire, and when sufficiently concentrated is to be neutralized with ammonia, then evaporated till it begins to crystallize; the crystals which form are of a very dark brown colour; they are to be treated with animal charcoal.

If in this preparation the gum arabic be replaced by sugar or starch, the same results are obtained. This acid affords crystalline salts with most of the alkalies and alkaline earths, if the acid be in excess, but the perfectly neutral salts it forms with these bases, are in general unsusceptible of assuming a regular shape. *Journ. de Chim. Med.*

MISCELLANY.

Arrow Root.—It is evident that pure fecula being chemically identical in all vegetables, must be identical in its medical properties. Hence it savours of charlatanism to insist on prescribing to a patient a foreign and expensive article, when a native and cheap substitute, possessed of the same properties, can always be procured. Thus, both arrow root and sago can be and are perfectly imitated by potatoe starch; so much so, that Mr. Raspail is inclined to believe that most of the sago of commerce is thus made. *Raspail. Chim. Organ.*

Cotton Lint and Bandages.—It has been observed that cotton could not be advantageously substituted for linen, in the preparation of lint, and some authors have asserted that this was owing to the fibres of the cotton being triangular, and thus becoming a source of irritation. This ridiculous assertion, has not the slightest foundation in fact. When viewed with the microscope, it will be found that the fibres of cotton are tubular, and somewhat flattened by the process of drying. The true explanation why cotton is not as good for lint &c. as linen, is that the fibres of flax are hollow tubes open at their extremities, whilst those of cotton are closed, hence the former are far better calculated to absorb any liquid than the latter. *Ibid.*

Kinic Acid.—According to an analysis of this acid by M. Baup, it appears that dry kinic acid is formed of 15 atoms of carbon, 20 of hydrogen and 10 of oxygen, or in the 100 parts, 50 of carbon, and 50 of hydrogen and oxygen in the same proportions as in water. This composition, like that given by Prout for ligneous fibre, is another example of isomery.
Journ. de Pharm. May, 1833.

Crystallization of certain Metallic Oxides.—Many of the metals as well as some of their oxides can be crystallized by well known chemical means, or by the aid of the electric forces; but the number of these crystallizations is limited, especially as regards anhydrous oxides. M. Becquerel conceived the idea of dissolving these oxides in the peroxide of potassium, thinking that this body, from its degree of oxigenation, would not possess the faculty of forming as intimate combinations with

them, as takes place with potassa, which is a more energetic base. It is well known, that peroxide of potassium is formed, whenever potassa is kept in a state of fusion, exposed to the action of the air. When the mass is cooled, and moistened with water, there is a disengagement of oxygen. If a metallic oxide be mixed with the potash, the two bodies act on each other, and a union takes place, and when this mass is cooled and treated with water, there is a disengagement of oxygen, and precipitation of the oxide in flocculæ, mixed with small crystals. If the oxide be dissolved in the potassa, protected from the action of the air, no crystals are formed; hence their formation is intimately connected with that of the peroxide of potassium. The oxides of copper, lead, cobalt and zinc, have been obtained in a crystallized form in this manner. *Ibid.*

Indelible Ink.—One pound of pure subcarbonate of soda is to be dissolved in ten pounds of boiling water, and four ounces of resin and eight pounds of wax cut into small pieces, are to be added to the solution, which is to be well stirred. Thirty ounces of this soap are to be dissolved in thirty pounds of boiling water, and filtered, then add two pounds of shellac dissolved and an ounce and a half of fish glue, mixed with one ounce of common salt. The shellac dissolves very readily; if, however, the soap is not sufficiently alcaline, add a small quantity of soda to hasten this solution which forms the liquid base of the ink. To give it a black colour, take one pound of grape charcoal, three ounces of animal charcoal, made with wool or gelatine, and an ounce and a half of charcoal sugar, triturate them well with a little indigo, when the powder is perfectly impalpable, mix it with the liquid, which is to be decanted from the dregs. This ink has all the necessary qualities. The fish glue and salt may be replaced by an equal quantity of gum arabic. The beauty of the ink depends on the fineness of the powders. It is unalterable in the air, and neither chlorine, nitric acid, diluted sulphuric acid, oxalic acid, potash, soda, boiling water &c. have effect on it.

Journ. de Chim. Med.

Cusparine.—M. Saladin has obtained a new principle from the Angustura bark by the following process. An alcoholic tincture of the Angustura, made in the proportions of 7 to 20 is permitted to evaporate slowly at a very low temperature; in a few days a kind of incipient mammillary crystallization will be perceptible in a magma of colouring and extractive matters. These crystals are to be carefully removed, drained, expressed and washed with a little water, when they appear in a regular but not very distinct form. By repeated treatment with alcohol of 8349, and finally agitating them with ether, and a little recently prepared hydrate of lead, they may be freed from all colouring and fatty matters, and on being crystallized at a temperature of 20° F. they may be obtained in

groups of tetrahedal prisms. Their solution in alcohol is bitter and somewhat pungent to the taste. They have no acid or basic reaction. The properties of this substance appear to be analogous to quinine, salicine &c. By the process above mentioned the quantity of cusparine obtained is equal to 13-1000 of the bark employed. *Ibid.*

Iodic Acid.—M. Grosourdy, gives the following process for obtaining this acid:—A current of chlorine is to be passed through a small Wolf's apparatus, in the bottles of which is pulverized iodine suspended in a small quantity of water. When the iodine is converted into a perchloride, the disengagement of the chlorine is to be stopped, and water poured into the brown liquid in the bottles, till the colour is destroyed, at which time all the perchloride has been converted into iodic and hydrochloric acids. The liquid is now to be saturated with pure carbonate of barytes, in fine powder, and very gradually added, till it creates no effervescence. There is now a formation of iodate of barytes and chloride of barium. The first being little soluble in water, and the latter readily so, they may be separated by repeated washings with cold water. The pure iodate is then to be treated with sulphuric acid diluted with four parts of water, taking care to use no excess. The whole is filtered, and the product evaporated and crystallized. *Ibid.*

Prussian Blue.—The presence of potassium in Prussian blue, which was first observed by Proust, has lately been a subject of dispute among chemists. Berzelius has given some interesting observations on it. On washing Prussian blue, it obstinately retains the cyanodide of potassium. Berzelius has found, however, that by perseverance in the washings, it may be entirely removed. Neither hot nor cold water decomposes Prussian blue, but on its being exposed for a long time to the combined action of air and water, a decomposition takes place at the expense of the air; the iron of the cyanodide oxidizes, and the cyanogen enters into other combinations; this operation, however, goes on very slowly. The fluid of these repeated washings of Prussian blue, contains no yellow ferro-cyanodide of potassium, the red cyanodide of Gmelin, only is in solution; hence, as a part of the iron is oxidated, the cyanogen forms a cyanodide which unites to that of potassium, and which is dissolved by the water; as this takes place at the expense of the air, it may be readily conceived that the process is a slow one.

The explanation of the presence of cyanodide of potassium in Prussian blue is to be found in an observation of Mosander's, who states that several of the ferro-cyanodides by being precipitated together, may unite and form triple combinations, but less permanent than the ferro-cyanodides which compose them. They are formed of one atom of cyanodide of iron, one of cyanodide of potassium, and one of cyanodide of barium, calcium or mag-

nesium, and may be considered as a double ferro-cyanodide of a positive base, or as a combination of two different ferro-cyanodides. Something similar takes place in the precipitation of Prussian blue by the ferro-cyanodide of potassium, if this latter salt be in excess, as soluble Prussian blue is formed, but which precipitates because it cannot dissolve in the water already saturated with other salts. This soluble blue appears to be composed of two atoms of ferro-cyanodide of potassium and three atoms of Prussian blue. This combination is not contained in Prussian blue as this latter is insoluble; when the salt of iron is in greater proportion than the ferro-cyanodide of potassium, there is a precipitate of a mixture of Prussian blue and an insoluble combination, which varies greatly in its composition, according to the excess of the ferruginous salt, the degree of concentration of the solution of the cyanodide of potassium, and its more or less prolonged contact with the salt of iron in excess. In washing the precipitate, the ferruginous salt is the first to dissolve; the water then begins to decompose the Prussian blue, the air and water cause the formation of oxide of iron, and at the same time there is a production of red cyanodide which dissolves, giving a yellow colour to the washings. The oxide of iron remains combined with the Prussian blue, forming a certain quantity of basic Prussian blue. *Journ. de Pharm.*

Gum Senegal.—Dr. Guillemin states that the best gum senegal is furnished by the *Acacia verek*, and the most astringent *bablah* by the *Mimosa arabica*. *Ibid.*

Arrow Root.—Mr. J. M. Walsh, in a thesis sustained at the *Ecole de Pharmacie Paris*, gives the following account of the arrow root of commerce, and the means of detecting adulterations of it. Under the name of arrow root, the feculs of the tuberous roots of several monocotyledenous plants of the natural orders *Aroideæ* and *Scitamineæ*, are usually comprehended. Thus the *Maranta arundinacea*, the *M. Indica* and *Curcuma angustifolia*, all furnish a good article, as does also the *Tacca pinnatifida*. In commerce, arrow root is often falsified with rice, wheat or oat flour, frequently with potatoe starch, but still more with cassava flour. The farinas of rice, wheat, or oats, are distinguished from arrow root by the azoted principle contained in them, and by the ammoniacal products they furnish on distillation. But as both cassava and potatoe fecula are analogous to arrow root in composition, other distinctive characters become necessary. On examination, it has been found that potatoe starch is insoluble in cold water, whilst the farina of cassava, and more especially the true arrow root, dissolve in it. The jellies made with each of these substances and an equal proportion of boiling water, differ from each other in consistence; the least so being that of cassava, next the arrow root, and then the potatoe. The jelly of barley flour liquifies more slowly

than the above, whilst that of arrow root melts with great rapidity in the mouth. When arrow root is pressed with the finger, it retains the impression, and a crackling noise is produced; this is not the case with potatoe starch or the farina of the cerealia. Cassava flour preserves the impression of the finger like arrow root, but may be generally distinguished from it by its smell and a somewhat acrid taste. When examined before the microscope, arrow root presents isolated grains like those of the other feculas, but has two circular impressions instead of one. *Ibid.*

Adulterations.—M. Dubail gave an account to the Society of Pharmacy of Paris of an adulteration of oil of anise. Some he examined he found to be a mixture of 5 parts of oil of anise, 10 parts of soap and 85 parts of alcohol of 34°; the whole covered with a stratum of the pure oil of anise. He also examined another parcel made for winter sales, in which there were 20 parts of soap, to imitate the thickness which the oil of anise assumes in cold weather. The same gentleman also reported an adulteration of oil of roses, by means of a solution of gelatine covered with the genuine article. *Ibid.*

Action of Magnesia on Valerian.—M. Planche has found that calcined magnesia forms a real combination with the odorous principle of valerian, hence mixtures into which these two substances enter, will not present the smell of the valerian. This combination is destroyed by the addition of any of the strong acids. *Ibid.*

Cascarilla.—According to Mr. E. Dubail the cascarilla bark is sometimes adulterated with that of the *Croton suberosum*. This resembles the true article in external appearance. It is generally in large convoluted pieces, about as thick as the thumb, and from one to two feet long. It has a less bitter, less aromatic, but more mucilaginous taste; when it is burnt, it exhales a far less agreeable odour than cascarilla. *Ibid.*

Spirit of Wood.—In distilling wood vinegar, a remarkable product is obtained, having a great resemblance to spirits of wine. It is, however, very impure, being coloured by a substance analogous to pitch, and mixed with an empyreumatic oil, which is more volatile than the spirit itself. M. Liebig has discovered a mode of purifying it perfectly, by first rectifying it, and saturating the product with chloride of calcium. The empyreumatic oil separates and collects on the surface of the liquid, whence it is easily removed, when the remainder is again to be distilled in a water bath. The pure spirit of wood thus obtained, is colourless, has a penetrating etherial smell, and a pungent, peppery taste; its specific gravity is 0.804. It burns with a blue flame of little brilliancy.

Ibid.

Salicine.—M. Duflos gives the following simple method of preparing salicine. The bark is to be exhausted of its soluble parts by three successive decoctions, the united products filtered and evaporated, till the liquid is three times as heavy as the bark employed; oxide of lead in fine powder is then to be added, and the mixture digested for twenty hours at a mild heat, taking care to stir it frequently, then filtered and evaporated to a syrupy consistence; the crystals that form are to be purified by solution in water and recrystallization. *Ibid.*

Strawberry Syrup.—According to M. Raymond, the method used by the confectioners of Paris for making this syrup affords an excellent article. They first form their syrup of sugar, and whilst boiling throw in the strawberries, keeping up the ebullition for five minutes, then remove the vessel from the fire and strain the syrup. *Ibid.*

Plant furnishing the Gum Bdellium.—The authors of the Flora of Senegambia have described this hitherto unknown plant. It is a shrub resembling the *Rhus oxycantha*, growing in sandy and arid situations in the interior of Senegal, flowering in March and April. It has been erected into a new genus *Heudelotia*—it belongs to octandria monogynia, and the natural order terebinthaceæ. *H. Africana.* Calyx one leaved, tubular, four-toothed, coloured; petals four, linear obtuse; stamina eight, four alternate longer than the petals and four shorter; style simple; drupe dry, fusiform, one celled; leaves trifoliate, folioles incised-dentate. The shrub is about eight to ten feet high, branched, spinose, with alternate leaves. Flowers are small, of a rose red colour, and collected in panicles. *Ibid.*

Manufacture of Chlorate of Potash. By M. Vee.—Into each of four earthen vases is to be introduced eight kilog. (20 lbs.) of manganese, in pieces about the size of a hazel nut. These vases are to be placed on a sand bath of a furnace, having four separate fire places. A leaden tube is to be adapted to each vase, and is to pass into a deep but narrow receiver, containing four killog. (10 lbs.) of quick lime, suspended in 40 litres (80 pints) of water. Into each vase is to be poured 25 kilog. (63 lbs,) of hydrochloric acid, the tubes are to be adjusted, and the receivers covered with a sheet of lead, luted with lime, and loaded with a weight to prevent the escape of the gas. When the action begins to slacken, the fire is to be lighted, and the contents of the receivers stirred to prevent the deposition of the lime.

At the close of the operation, if manganese of a good quality has been used, solutions of chloride of lime of 12° or 13° will be obtained. The contents of the receiver are permitted to settle, the clear liquid poured off, and the deposit which is formed of a small excess of lime, and insoluble subchloride of lime, is drained and washed.

All the liquids are to be united, and four kilog. (10 lbs.) of slackened lime added to them, and a fresh current of chlorine passed through the mixture; this chlorine is to be made as before, except that as in the first operation there was an excess of manganese, the residue is to be washed and again used. This second operation ought to give a solution of chloride of lime of 18° or 20°, which is to undergo the same train of processes as at first.

When a concentrated solution of chloride of lime is thus obtained, it is to be poured into a leaden boiler, and a brisk fire kept up under it; when it begins to heat, dissolve in it a sufficient quantity of chloride of potassium to raise the density of the fluid 3° or 4° B; when it is to evaporate as speedily as possible to 30° or 31° B. It must be attentively watched during the first part of the ebullition, as there is sometimes so great a disengagement of oxygen, as to throw out a considerable portion of the liquid; at other times this disengagement is scarcely perceptible.

When sufficiently concentrated, the solution is to be put aside to crystallize in earthen vessels, in as cold a situation as possible, when there will be a deposit of a mixture of chlorate of potash and chloride of potassium, differing in proportion according to the operation. The mother waters are again to be evaporated to 36°, when they will afford an additional quantity of chloride of potassium, after which they contain but little except hydrochlorate of lime, but retain a strong smell of chlorine.

The impure salts arising from the first crystallization, are to be dissolved, and the solution making 15° or 16°, filtered, when pure chlorate of potash will be obtained; evaporated to 18° an additional quantity is sometimes the result, but generally it is mixed with a large proportion of chloride of potassium; after this last concentration, the mother waters contain scarcely any thing but this latter, and are to be evaporated to obtain it.

The products of two operations, requiring 112 kilog. (270 lbs.) manganese, and 400 kilog. (1000 lbs.) hydrochloric acid, will be from 9 to 17 kilog. (22 to 42 lbs.) of chlorate of potash. *Journ. de Chim. Med.*

Acids in Nux vomica.—Mr. Corriol has discovered a new acid in Nux vomica differing from the Igasuric acid of Pelletier and Caventou. This acid exists in a state of combination with lime, with which it forms a very soluble salt, which crystallizes in a granular mass, when the aqueous extract of Nux vomica is treated with alcohol and distilled. This saline mass should be purified as much as possible by pressure, and by repeated solutions and crystallizations in water and alcohol. When the salt is perfectly white, it is to be dissolved in water and decomposed by means of oxalic acid. The free acid thus obtained may be concentrated to a syrupy consistence in vacuo, without crystallizing. When dried it is volatile, and forms more or less soluble salts with the salifiable bases,

and gives rise to crystallizable compounds with the vegetable alkalies. When it is distilled in a bath of sulphuric acid, it becomes concentrated and assumes the consistence of butter, or sublimes in well defined crystals on the sides of the retort. The concrete acid is soluble in boiling water, alcohol and ether, and from which it crystallizes on cooling. Mr. Corriol also discovered another acid in this substance, which he proposes to examine more particularly.—(*Journ. de Pharm. March.*) In a subsequent number of the same work Mr. Corriœ states that he has verified the identity of this acid with the Zumic, to which he assigns characters differing from those described by Braconnot; the inaccuracy of whose account had misled him. *Journ. de Pharm.*

Manganesiate of Potash.—M. Wohler gives the following mode of obtaining this salt:—Melt chlorate of potash in a platina crucible, over a spirit lamp. Dissolve in it a piece of pure potash and peroxide of manganese in powder. A beautiful green solution is formed, containing the green manganesiate of potash and chloride of potassium. The mass is to be dissolved in boiling water, when the green colour changes to a brilliant purple, the manganesiate being transformed into a per-manganesiate, Decant and evaporate. Small, opaque, black crystals of the per-manganesiate, having greenish metallic lustre, will be obtained. This salt is isomorphous with the perchlorate, and they may be crystallized together in all proportions, affording salts of great beauty, and of very different shades of colour. *Ibid.*

Crystallization of Iron.—Mr. Wohler states that iron bars of two inches in thickness, subjected to a white heat for a great length of time in a blast furnace, presented a brilliant and lamellar texture on being broken, although they had originally been of a fine grain. On breaking them, Mr. Wohler was able to separate perfect cubes, several of which were an inch square. These cubes had a rectangular cleavage, as perfect as that of galena, which mineral they closely resembled. This crystallization is the more remarkable, as the iron had not melted. Iron presents another crystalline form, which is sometimes to be observed in the cavities which occur in large masses of melted iron. These crystals are either octohædrons, or portions of octohædrons.

Journ. de Pharm. May, 1833.